PRACTICAL ECONOMICS

PRACTICAL ECONOMICS

BY

HENRY P. SHEARMAN

Professor of Economics, School of Business Administration
Miami University

SECOND EDITION
THIRD IMPRESSION

McGRAW-HILL BOOK COMPANY, INC.
NEW YORK: 370 SEVENTH AVENUE
LONDON: 6 & 8 BOUVERIE ST., E. C. 4

COPYRIGHT, 1922, 1929, BY THE
McGRAW-HILL BOOK COMPANY, INC.

PRINTED IN THE UNITED STATES OF AMERICA

PREFACE TO THE SECOND EDITION

While this new edition of "Practical Economics" has been thoroughly revised and considerable new material added, the original purpose of the text has been strictly adhered to, namely, to present the fundamental theories and principles of economics as concisely as is consistent with their adequate treatment, and in the simplest language possible.

Several chapters have been completely rewritten, and the subject matter throughout the whole text has been brought up to date by the incorporation of new data. An entirely new chapter has been written on monopoly, with especial emphasis on industrial monopoly. The chapter on banking has been completely rewritten with a comprehensive description of the organization and functioning of the Federal Reserve System. The chapters dealing with business organization have been augmented and brought up to date by the inclusion of new material on industrial concentration. The latest wholesale and retail index numbers show recent changes in the value of money and the cost of living. Some of the recent trends in the fields of industry and commerce, such as the increased mechanization of industry, mass demand creation and installment selling contribute to keep the new edition abreast of the times.

The general purpose of the new text is to give the reader an adequate understanding of the economic world in which he lives, the major institutions set up within it, and the fundamental laws and principles governing economic activities. The relation between economic theory and business practice is kept constantly in mind. The economic laws underlying business activities are revealed and the methods and practices of business concerns are used to illustrate the operation of economic principles.

Miami University,
Oxford, Ohio,
June, 1929.

Henry P. Shearman.

PREFACE TO THE FIRST EDITION

The rise and rapid spread of business education which has been such a prominent feature of our modern educational system has not only resulted in a call for courses dealing with particular fields of business activity, as accounting, banking and selling, but has considerably augmented the demand for a knowledge of the general theory of business as treated in the science of economics.

From long association with business men, as well as from the teaching and discussion of economics with students drawn largely from the ranks of practical men of affairs, I have been impressed with the insistent demand for a simpler and more concrete statement of economic theory than is usually found in the standard works.

To satisfy this demand the present book has been prepared.

No attempt has been made to depart radically from standard economic theory. The aim has rather been to state in simple language and to explain as concisely as possible, the general laws and principles underlying and governing the production and distribution of wealth in the United States today, for the benefit of all who desire to gain a clearer understanding of the structure of our economic system and of the forces operating within it. In consideration of the increasingly important part played in modern affairs by business organization, more attention has been devoted to it than has been customary; and it is treated as a separate factor in production along with land, labor and capital.

While of course economics is concerned with the theory of business and its peculiar function is to set forth the operation of those broad and fundamental laws governing business as a whole, special pains have been taken to point out their practical consequences in everyday business life. In other words, the connection between theory and practice has been kept constantly in view and wherever possible the practical application of laws

has been pointed out by illustrations drawn from modern business practice.

Furthermore, the human side of the subject has been emphasized and frequent reference has been made to the bearing of economic laws on the personal interests of individuals whose welfare in the aggregate constitutes the national well-being.

The economic problems of today have assumed such proportions as to have completely outgrown adequate treatment in an elementary text and are now rightly and better dealt with in separate treatises. No attempt has been made, therefore, to crowd these in, but rather to state clearly the laws and principles on which they rest. Here again every opportunity has been taken to point out the relationship between the laws discussed and the questions of the day upon which they bear.

In writing on a subject which has so challenged the attention of thoughtful men for centuries and which already has such a rich literature one must naturally owe much to previous writers. On account of their number, I regret that I must limit myself to a general acknowledgment of my indebtedness. To my old colleague Dr. Wm. M. Deviny and to Dr. Wm. H. Walker, both of whom read a large part of the manuscript, I tender my thanks. During the five years the book was in progress, very able and courteous service was afforded me in research and statistical work by the staff of the reference department of the Carnegie Library of Pittsburgh.

OXFORD,
OHIO.

HENRY P. SHEARMAN.

CONTENTS

PAGE

PREFACE TO THE SECOND EDITION v
PREFACE TO THE FIRST EDITION vii

PART I

EXPLANATORY AND INTRODUCTORY

CHAPTER

I. Economics—Its Purpose and Value 3

PART II

ANALYSIS OF THE BASIC FACTORS ON WHICH THE PRODUCTION OF ALL WEALTH DEPENDS

II. Factors of Production: Nature 15
III. The Nature of the Productive Process 36
IV. The Qualities Determining the Efficiency of Labor . . . 48
V. The Division of Labor: Its Advantages and Disadvantages 61
VI. Capital as a Factor in Production 77
VII. The Two Important Functions Performed by Capital in Modern Production 89
VIII. Organization as a Factor in Production 102
IX. Large-scale Organization 119
X. The Economies of Large-scale Organization 136

PART III

EXCHANGE, VALUES, AND PRICES

XI. Origin and Nature of Value 151
XII. The Law of Demand and Supply 162
XIII. The Forces behind Demand; the Determination of Individual Demand 174
XIV. The Determination of Total Demand 185
XV. The Forces behind Supply—Cost of Production . . . 206
XVI. Influence of Cost on Supply 219
XVII. Influence of Cost and Utility on Price 231

CHAPTER PAGE
XVIII. The Influence of Monopoly on Price 243
XIX. Nature and Extent of Industrial Monopoly 258
XX. Money 282
XXI. Deposit Currency and the Banking System of the United States 301
XXII. Changes in the Value of Money, or the Level of Prices and Their Measurement 324
XXIII. Causes and Effects of Price Changes; and Foreign Exchange 343

PART IV

ANALYSIS OF THE FOUR FORMS OF INCOME AND FACTORS DETERMINING THEIR AMOUNTS

XXIV. The Distribution of Wealth 361
XXV. Rent 376
XXVI. Wages—Factors on the Demand Side 391
XXVII. Wages—Factors on the Supply Side 406
XXVIII. Interest 428
XXIX. Profit 441
INDEX 461

PART I

EXPLANATORY AND INTRODUCTORY

PRACTICAL ECONOMICS

CHAPTER I

ECONOMICS: ITS PURPOSE AND VALUE

Definition.

In approaching a study, a definition serves somewhat the same purpose as a telescope in the hands of a passenger on an Atlantic liner; it enables him to locate and obtain a bird's-eye view of a distant port long before it is even visible to the naked eye. Although the view is of necessity compressed into a small compass, it at least affords him some idea of the location of the place toward which he is heading and of its main outlines. A long-distance definition of economics, or political economy as it is sometimes termed, tells us it is that science which treats of man's efforts to provide himself with food, clothing, shelter, and whatever else he deems essential to his welfare. Drawing a little closer, we see that it is concerned with business activities and institutions. Hence, it is often spoken of as the science of business, and if the word "business" is used in its broadest sense to cover a nation's activities in the production, exchange, and distribution of wealth, such a definition is both practical and sound.

Point of View.

The business activities of a modern nation like the United States comprise a miscellaneous mass of practices by means of which more than a hundred million people in competition and cooperation with each other satisfy their varied wants. Each individual engrossed in his own particular work and interested in his own private ends rarely understands the working of the whole system of which he and his affairs occupy but a fractional part. In consequence, his views of certain sec-

tions of activity or of the system as a whole are apt to be warped by his own interests. It is precisely this deficiency that economics seeks to correct by substituting for the viewpoint of the private individual, the broader one of society as a whole.

It is important to stress this feature of economics, for the angle from which a subject is studied makes an appreciable difference in one's understanding of it. The same institution or phenomenon observed from opposite sides may not only appear different in character but actually be different. Wages to the worker are his means of livelihood; to the employer they are costs; to the economist they constitute the share of the net product of industry paid to the worker for the part he has played in production. Profits to the individual business concern are the difference between costs and receipts; but from the viewpoint of society they are the amounts necessary to stimulate and insure business enterprise. A strike or a lockout in a given industry may appear to the combatants a perfectly justifiable method of settling a wage dispute, but to the community it may mean discomfort and even privation. An invention that throws a worker out of a job is a harmful thing, in his eyes; to the inventor to whom it brings a fortune, it appears in just the opposite light. To society, it is an instrument of progress, hurtful perhaps to the individual worker for the time being, though beneficial to labor in the long run. The business corporation is to the stockholders a source of profit; to the economist it is the agency by means of which land, labor, and capital are coordinated to supply the nation's needs. Economics studies business institutions and activities not solely in relation to individual or class interests but in their bearing on the interests of the nation at large. It stands as the champion of the economic welfare of the people as a whole.

Studies Business as a Whole.

The aggregate of business institutions and practices of a nation at a given time is sometimes referred to as its economic system. But it is evident these do not constitute a separate system in the sense that a government is a system with a central controlling head. It is possible, either by revolution such as we have witnessed in Russia or by the more peaceful path of

evolution, that these may become merged into one unified organization operating under the control of a centralized management. Such is the dream of the Socialists. But in the world as it is, the economic activities of each nation are carried on by a host of separate though closely related individuals and organizations. This vast and varied mass of institutions and activities is the economic system by means of which the wealth of the nation is produced, exchanged, and apportioned among its members. It is the object of economics as a science to study these activities as a whole in a systematic way, to describe them, to show the relationships of the various parts, and the laws and principles governing them.

RELATION OF ECONOMICS TO SPECIALIZED ECONOMIC STUDIES

To explain the operation of all parts and branches of modern business; to describe all kinds of business organizations; to present the laws and principles governing manufacturing, transportation, commerce, and finance; to solve the baffling problems arising in connection with the production, exchange, and distribution of wealth, such as the tariff, monopoly control, government regulation of industry, the question of labor and capital, and so on—would be today a stupendous task for any one science. When economics was in its infancy in the time of Adam Smith, all the known laws and principles governing business might have been included in one general treatise. Since that time, especially during recent years as a result of inductive study, of increased statistical investigation and research, an evergrowing body of data covering separate fields has been gathered, new laws and principles have been formulated, and many corollaries to the general laws have been added. To include these in one treatise is practically impossible. Since the first general treatise was written by Adam Smith in 1776, the present science has branched out. The leading universities in the United States and similar institutions in England, Germany, and other countries are now teaching intensive courses in many separate fields of business activity.

Of these separate subjects some, like salesmanship and industrial organization and management, are yet relatively unde-

veloped and to a certain extent lack the broad, social viewpoint. Others, like money and currency, foreign exchange, industrial combinations, labor organizations, etc., are in reality divisions of economics, being separate treatises the outcome of intensive study of special phases of economic activity looked at from the social viewpoint.

The relation between these separate economic studies and economics is evident. Each of the former is confined to a specific sphere of business activity and aims to explain its institutions and activities, to discover the laws and principles governing its operation, whether it be selling, management, finance, or tariff regulations. But economics covers the whole field in a general way and aims to display those broad general laws and principles that govern business as a whole. It carries out a survey of the entire field in order to give a bird's-eye view and enable the individual to obtain a perspective of that miscellaneous complex of activities constituting modern business, so that whatever particular branch he may study or practice later, he may by virtue of his broader vision sense his relation to other activities and his part in the whole. For this reason, economics is sometimes spoken of as the *general* science of business.

Methods.

There are two methods of building up a science—deduction and induction. In the older sciences, such as astronomy and mathematics, the former was chiefly used; in the more modern, the latter method, sometimes termed the Baconian method on account of the emphasis placed on it by Francis Bacon, is largely employed. In deduction, the general conclusion or hypothesis is put forth first and then tested out by application to particular cases. In induction, a study is made of a particular case, as a result of which a general conclusion is arrived at. But in deduction the *a priori* conclusion is itself the result of a certain amount of observation, while in induction the selection of specific instances is more or less aided by preconceived conclusions. Indeed, as someone has aptly remarked, in the building up of any science both deduction and induction are as essential as are the right and left foot in walking.

In the early stages of economics, deduction played an im-

portant part in formulating the general laws of the science but more recently the inductive method, especially in its statistical form, has been increasingly used. The growth of statistics has much enriched the science of economics both in the discovery of new laws and in the verification of the old. Whatever economics was in its infancy, it has taken on a very practical aspect of later years. Some of its early doctrines not standing the acid test of experience have been thrown aside; and with modern research and statistical investigation into actual business practices, facts laws and principles have resulted which are forged out of actual practice and tested by business experience.

An Inexact Science.

One of the chief charms of economics and at the same time its weakness as a science lies in its very humanness. Unlike astronomy, physics, or chemistry, it is not an *exact* science. By this is meant that its laws and principles are not statements of relationship or movements of forces that act inevitably in a fixed manner and with an exactness capable of being measured to a fraction. The wages of labor, the upward and downward swings of prices, the movements of foreign exchange rates, the flow of gold are governed by laws but not by rigid laws like those that determine the movement of the stars or of inanimate matter in general. The astronomer is able to predict to a fraction of a second the appearance of a star that swings into his vision but once in a hundred years; the chemist knows with surety that whenever he mixes certain chemicals a given reaction will always result and he is able to measure the result quantitatively. But the economist, because he treats largely of human forces and activities based on human relationships, cannot predict results with the same sureness or measure causes and effects with the same exactness. He may know that the amount of a commodity that will be purchased will vary inversely with the price charged but he may not know exactly how much an increase of 25 per cent on the price will reduce its sale. The laws of economics, therefore, like those of its sister social sciences, ethics and politics, are not hard-and-fast statements of invariable facts but rather statements of tendencies admitting of numerous exceptions.

The inexact and general nature of some economic laws by no means deprives them of their usefulness or invalidates economics as a science, though there is no doubt but that a lack of a proper understanding of this feature of the science has been a cause of its misjudgment. The fault lies partly with economists who have sometimes exaggerated the accuracy with which some of the more general laws operate in actual life. On the other hand, some of the criticism has been due to a misconception on the part of many practical business men as to what a science really is and failure to make allowance for the uncertain nature of the subject matter with which economics deals.

It is natural for hard-headed business men to want laws capable of specific and immediate application to given conditions. Many of the rules and principles of specialized economic studies are of this character but many of the laws of economics are general in nature and call for judgment in applying them to concrete cases; their action is often modified by other factors and forces which must be taken into consideration. Moreover, some are what might be termed long-distance laws, requiring considerable periods of time for their operation and often their immediate effects are quite opposite to their ultimate consequences, as in the case of the effect of machinery on labor. But to lay the blame of this on economics is to lay it at the wrong door, for the remoteness and uncertainty of its laws are not due to the science but to the complexity of the activities it seeks to explain.

Much of the criticism launched against economics arises from the popular and ancient misconception of the relation between theory and fact which in the minds of some will always appear to be antagonistic. But theory in the only sense in which it finds a permanent place in a science must be in harmony with facts. In themselves, facts are valueless. What is needed is an understanding of facts, of their causes and effects. Such an understanding is gained by an explanation. Such an explanation is a theory. Of course, there are false theories but to condemn all theories because some are false would be equivalent to a refusal to accept money because it is sometimes counterfeited. Yet there is usually some basis for popular beliefs and the origin of the popular suspicion of theory is no doubt due to this tend-

ency of theory to depart sometimes from acutal facts. In attempting to explain a given phenomenon, to find its cause a scientist will often start with a hypothesis or what the man in the street would call a "guess." With this as a guide he will investigate just as a mechanic in trying to find what is wrong with his motor, after listening, perhaps will conclude that the trouble lies in the carburetor. He then tests his theory out. So, also, does the scientist, but so complicated are some of the problems of the scientist and so anxious is he to explain them, that he may neglect to test his theory sufficiently and proclaim that which is true in a few cases to be true universally. Or he may become so enamoured by his theory that he is carried away by it, fitting and adapting the facts to the theory instead of the theory to the facts. The antagonism of the man in the street to theory is thus a warning against fanciful theories and too hasty generalization. Economics, like other sciences, has doubtless been guilty in this respect but recently it has profited much by criticism and tends more and more to test out its conclusions and discard those which when weighed in the balance of experience are found wanting.

Values.

In former years, a knowledge of economics was mostly confined to those engaged in the administration of public affairs. But while it is evident that those directly responsible for the welfare of the nation should be thoroughly conversant with the laws and principles on which national prosperity is founded, it is not desirable in this democratic age that such knowledge be restricted to the few in the seats of the mighty, especially in consideration of the fact that modern politicians themselves are none too well versed in the science. The majority of the leading questions of the day, decisions upon which directly affect the destinies of the nation and the happiness of the people, are economic. Their issues are often beclouded and warped by deep-rooted class or local prejudice. There is needed for their consideration the broad social viewpoint and a clear knowledge of those fundamental laws governing not only domestic affairs but foreign trade. This knowledge should be in the possession of the people themselves. Any country with a large body of its citizens

in ignorance of general economic truths on which national prosperity rests is in danger of having its masses influenced by false propaganda and its legislation warped by special interests. The need for an enlightened public opinion on economic subjects was never more acute than today.

Not only on grounds of public policy is a knowledge of economics desirable but for the sake of individual economic advancement. Personal experience will always be the basis of business ability but the influences that play upon a modern business extend far beyond any one man's individual experience. Less and less are business concerns influenced only by local conditions; more and more are they affected by world happenings. The narrow provincialism which has so often characterized American business men in the past is necessarily giving away to a more cosmopolitan outlook. The granting of credits by banks, the borrowing of funds by corporations, the purchasing of raw materials, the planning of selling campaigns, the extension of plants, the location of new factories—all demand on the part of those responsible, not only a specialized knowledge of credits, plant management, selling, etc., but a familiarity with business conditions in general. The executive today needs to be master not merely of his particular field but of the broad fundamental laws governing business as a whole. The ability to interpret conditions, read the signs of the times, forecast depressions or booms, price rises or falls, the effect of a tariff, and other economic tendencies which might wreck or further his plans, enables him to adjust his affairs to outside conditions in such a manner as to avoid failure and achieve success. What the science of navigation and a knowledge of undercurrents and hidden rocks of the ocean are to the captain on the bridge of the Atlantic liner, the science of economics is to the executive at the helm of a business, enabling him to avoid the hidden shoals in the sea of business affairs.

It has been said that while economics is essential for executives or college men who later will assume positions of responsibility, it is wasted time teaching it to clerks or mechanics. There is an element of truth in this. A clerk may not require the same education as a banker. And, providing the clerk intends to remain a clerk, a couple of courses in accounting will

better fit his needs and bring him in the immediate remuneration which as a rule marks the limit of his financial horizon. But there is a constant and growing demand today on the part of business corporations for men with a broader training along economic lines, for men equipped with a knowledge of the underlying principles of business methods and practices to fill executive and subexecutive positions. Economics therefore has a strong appeal to the high-caliber man in clerical work ambitious to prepare himself for more important service in the future.

One danger facing the young man entering business life today is its narrow specialization. Where his father started in a small concern in which he was able to pick up by experience a working knowledge of the different branches of the business, the youth today pigeon-holed perhaps in one department of a big corporation finds sparse opportunity for securing that all-round training and broader viewpoint so necessary for executive work. While a study of economics alone cannot remedy this, it will materially help him to broaden out. His knowledge of economic laws and principles will give him an insight into the meaning of happenings in his own concern and the world around him which the man beside him will lack. He will be able to read with intelligence articles on economic subjects in the financial and business magazines which are unintelligible to the man in the street. In the office or club or on the platform, he will be better equipped to discuss the questions of the day. Truly, it will give him a deeper insight into life itself, for no study is more thoroughly enlightening regarding human affairs than that which treats of mankind's struggle to make a living.

Summary.

Economics is concerned with business activities and is sometimes termed the general science of business. While certain sciences specialize in particular branches of business, economics covers the whole of business and studies the fundamental forces underlying business activities and the laws governing their operation. Economics is not an exact science. The economist deals largely with human forces and activities based on human relationships and cannot predict results with the same sureness

or measure causes and effects with the same precision as can, for example, the chemist who works with inanimate matter. The science of economics has been recently enriched by the rapid strides made in business research and in the growth of business statistics which have provided a mass of valuable data by means of which old theories have been tested and new laws and principles evolved. A knowledge of economics is helpful in that it gives a deeper insight into the hidden forces determining business conditions and the principles underlying business practices.

Test Questions

1. What is "Economics"?
2. From what point of view are business activities studied in economics?
3. What is the relation of economics to the specialized business courses such as accounting, banking and selling?
4. What is meant by referring to economics as an inexact science?
5. What is theory? What kind of theory is referred to in the statement—"The eternal conflict between theory and fact"? How can theory and practice be reconciled?
6. Name some of the values to be derived from a study of economics.

References

CAIRNES, J. E., "Character and Logical Method of Political Economy," 2d Ed., 1845.

CLAY, H., "Economics for the General Reader," Chap. I.

ELY, R. T., "The Past and Present of Political Economy," Johns Hopkins University Studies in Historical and Political Science.

GIDE, C., "Political Economy," Book II, Chap. II.

KEYNES, J. N., "The Scope and Method of Political Economy," London, 1891.

LAUGHLIN, J. L., "Study of Political Economy."

MARSHALL, A., "Principles of Economics," Chap. I.

PALGRAVE, "Dictionary of Political Economy," Vol. 3.

PIERSON, N. G., "Principles of Economics" (Introduction).

ROSS, E. A., "The Foundations of Sociology," Chaps. I, II.

SELIGMAN, E. R. A., "Principles of Economics," Chap. II.

SMITH, A., "Wealth of Nations" (Introductory Sketch).

SMITH, R. MAYO, "Statistics and Economics," Chap. I, 1899.

WICKSTEED, P. H., "The Common Sense of Political Economy" (Introduction).

PART II

ANALYSIS OF THE BASIC FACTORS ON WHICH THE PRODUCTION OF ALL WEALTH DEPENDS

CHAPTER II

FACTORS OF PRODUCTION: NATURE

The primary factors in the production of wealth are nature and man. Nature supplies the material and forces out of which and by which wealth is produced. Man, the active agent, directs the processes of production by physical and mental effort. Capital, usually termed a secondary factor because itself a product of nature and man, supplies the tools and goods which aid in further production. Organization appears as a fourth factor, the product of the first three, and the means by which they are coordinated for effective production. A clear understanding of each of these factors, of the part each one plays, of the causes affecting the efficiency of each, and of the relationship existing among them, will enable us to secure a comprehensive grasp of the principles governing modern production.

The Part Played by Nature in Production.

Nature or "land," as this factor is often termed, not only provides in the surface of the earth a solid foundation for man's activities but also, in addition, is the sole source of the raw materials and forces used in production. From the mines of the earth come the metals and minerals, iron, coal, copper, and petroleum; from the rich productive soil spring crops of cotton and corn. The forests furnish lumber; the rivers and lakes, water. In the fashioning of these raw materials into objects of wealth, man is greatly aided by forces inherent in the materials themselves. Modern chemistry has shown that matter is not dead but dynamic with latent powers. In the laboratory, the industrial chemist experimenting with these hidden forces induces reactions which result in dyes, alloys, gases, or fuels. Organic chemistry, with the theory of valences, has opened up a new world of natural forces, which, under the skilful manipulation of the chemist, are being used to produce products hitherto found

only in a natural state or to create new ones better adapted to man's new needs. Furthermore, man's own labor has been tremendously augmented by the employment of natural forces, such as the expansive force of steam, the explosive force of gases, and electricity. The revolution which industry has undergone in the last 100 years is largely due to man's discovery and use of these powerful forces. The earth, the ocean, and the atmosphere are the reservoirs of Mother Nature, from whose depths and heights come not only all the materials on which man depends for the support of life but also the physical, chemical, and vital forces employed to work these into shape for the satisfaction of his wants.

Alexander Hamilton and the Error of the Physiocrats.

The practical value of a thorough grasp of the part played by nature in production as well as the danger of a half knowledge is illustrated in the stand taken by Alexander Hamilton against the famous "error" of the physiocrats. The physiocrats, a French school of economists of the eighteenth century, saw the influence of nature in agriculture but were blind to its connection with manufactures. This led them to exalt agriculture at the expense of manufacturing, which they regarded as sterile. Agriculture, they asserted, was productive because assisted by nature in a special sense, but manufactures not receiving this cooperation were unproductive. The farmer planting a seed into the soil reaped a hundredfold through the vital laws of growth and so enriched the nation; but the manufacturer who in their opinion merely changed the form of things added nothing to the existing wealth.

Their theories were reflected in France by the discouragement of manufactures through heavy taxation, which was thrown off only by the French Revolution. This same error crossing the Atlantic attempted to stunt the early development of manufactures in the United States. At the adoption of the Constitution, this country, with its abundance of fertile land, was particularly adapted to agriculture. This natural adaptation was emphasized by the mercantile policy of Great Britain which encouraged the exportation of raw materials from the States, in return for manufactured articles.

Many believed that the future interests of the nation would be best attained by keeping it an agricultural country, and they vehemently opposed the establishment of manufactures. In his *Report on Manufactures,* presented to the House of Representatives Dec. 5, 1791, Alexander Hamilton said:

> There are still, nevertheless, respectable patrons of opinions unfriendly to the encouragement of manufactures. The following are substantially the arguments by which these opinions are defended. "In every country," say those who entertain them, "agriculture is the most beneficial and productive object of human industry. This position, generally if not universally true, applies with peculiar emphasis to the United States on account of their immense tracts of fertile territory, uninhabited and improved. Nothing can afford so advantageous an employment for capital and labor as the conversion of this extensive wilderness into cultivated farms. Nothing equally with this can contribute to the population, strength and real riches of the country."

It has been maintained that agriculture is not only the most productive but also the only productive species of industry. The reality of this suggestion, in either respect, has, however, not been verified by any accurate detail of facts and calculations, and the general arguments which are adduced to prove it are rather subtle and paradoxical than solid or convincing.

It was well for the future of the nation that its destinies were guided in this formative period of its existence by a thinker as shrewd and a statesman as practical as Alexander Hamilton, who saw through the error which distorted the vision of others. There is no doubt that industry would ultimately have forged ahead, but had it been exposed in its infancy to the frosts of external and the forces of internal opposition, its growth would have been retarded. The extraordinary rapidity which has marked the development of manufactures and the consequent rise of the United States to its present commanding position among the nations is due, in no small measure, to the farsighted economic policies of Alexander Hamilton. It is imperative that the nation should see clearly the relationship of nature to her industries.

The Importance of a Wise Conservation of National Resources.

It is a peculiar paradox of modern life that while man's dependence on nature is increasing, through his ever increasing

wants, his sense of dependence on nature is decreasing. Living in big cities, working day by day in manufacturing plants, far removed from the sources of the materials he is using, it is little wonder that he scarce gives a thought to their origin. So busily engaged is he in earning and consuming his share of the proceeds that he seldom pauses to consider whether the original sources of supply are exhaustible or not. The subject is not one that appeals spontaneously to the average individual, though it concerns him more closely than he imagines. The conservation of natural resources is essentially an economic question for the consideration of the whole nation. The nation which neglects to take stock of these resources is in the position of a man who inherits a bank account and in spending it fails to keep track of the balance. It is easy to overdraw. The significance of certain well-attested facts regarding the rapid rate of consumption of some of the principal resources of the United States seems to call for a national stock taking. It is high time to bring the subject of conservation to the foreground of national consciousness. A back-to-nature movement in economic thought would exert a wholesome influence on the nation. A deeper realization by the producers of the nation of their ultimate dependence on the natural resources of the country would tend to check needless waste and to encourage a wise conservation of those resources. Its consideration requires a certain loftiness of purpose and farsightedness of vision, embracing, as it does, not only the welfare of the millions of today but also of generations unborn.

Renewable and Non-renewable Resources.

For the purposes of conservation, natural economic resources may be divided into renewable and non-renewable. The waters, the forests, and the soil constitute the former. These may be retained in their original quantities and even improved by wise use. A good farmer on retiring leaves his farm in better condition than when he began its cultivation. The non-renewable resources consist of the fuels, metals, and chemicals; once taken from the ground they cannot be replaced. The purpose of conservation is to maintain the renewable resources in an undiminished state and to utilize the non-renewable resources with the greatest economy. It is outside the scope of the present chapter

to make a complete survey of the resources of the United States. A brief presentation of the facts in reference to two or three of the principal resources will reveal their basic relationship to the industrial prosperity of the nation.

The custom of the United States from its inception until very recently has been to keep its gates wide open to the rest of the world, giving freely of its land and resources to all who sought citizenship. In times gone by, it seemed that those resources were unlimited. Today, owing to the remarkable growth of its population from a paltry 4,000,000 in 1790 to more than 125,000,000, it finds itself in a very different situation.

Importance to the United States of Forest Conservation.

Russia, the British Empire, Brazil, and America possess two-thirds of the 7,500,000,000 acres which constitute the world's forest reserves. The United States owns 783,000,000 acres, including 95,000,000 in Alaska and 38,000,000 in the Philippines. The significant fact is that while the United States possesses 9.1 per cent of the world's supply of lumber, she cuts annually 52 per cent of the saw timber of the world.

About three-fifths of the original forests of the United States have already gone. We take from our forests each year, not counting the loss by fire, three and a half times their annual growth. The number of feet cut rose from 18,000,000,000 in 1880 to 34,000,000,000 in 1905, nearly doubling in 25 years. In the last 20 years, however, the annual cut has not increased so rapidly as before. In 1926, it totaled 36,936,000,000.

In the face of our diminishing forests, with the growing scarcity of lumber, is the increased demand for wood. In spite of the substitution which has taken place of iron, brick, concrete, and stucco for wood in the construction of bridges, railway cars, automobiles, ships, houses, furniture, and other products originally made of wood, the total and per capita demand for wood continues to increase. This is due to the increased quantity of all products for which wood is used and, also, to new uses to which wood has been put. Take, for example, the per capita demand for wood pulp for paper, which has increased from 18 cubic feet in 1879 to 169 cubic feet in 1923. At this rate, in the half century from 1879 to 1929, there will have occurred a

tenfold increase in the use of paper and a corresponding increase in the use of wood pulp from 700,000 to 7,000,000 cords per year.

The tendency of the present age is for man to rely less and less on materials furnished ready to his hand by nature, and no doubt as time goes on he will fabricate substitutes for wood grown in the forests, but this will be a relatively slow process. In the meantime, the growing scarcity of lumber will be reflected in higher prices, which will force greater economy in the use of wood and stimulate the invention of substitutes. From 1899 to 1926, the average mill value of all kinds of lumber in the United States rose from $11 to $27 per 1,000 board feet.

In the light of the above facts, the supreme importance of a wise policy of forest conservation for the United States is obvious. This is of interest both to consumers of wood products who must pay a higher price for what they buy and to manufacturers whose cost of production will be raised. The recent agitation by the news-print paper industry and the advertising profession for better methods of forestry and the preservation of our forest reserves is an indication of an awakening on the part of some of our industries to the practical importance of the conservation of the valuable forest reserves of the United States.

Other countries have been forced to conserve their supply. Germany spent $80,000,000 in a year on the preservation of her forests, and at the beginning of the World War her annual growth was rapidly approaching her annual cut. Sweden has an admirable policy of forest conservation. Lumbering is her second important industry. She goes at it scientifically and is growing forests instead of devastating them, as has been so often done in this country in the past. Japan has 59 per cent of her total area under forests. China has paid no attention to her forests and has paid the penalty, for they are almost extinct. The present United States Forest Service declares that under right management our forests will yield four times as much as now. This organization is doing everything in its power to improve forestry methods and to conserve our forests. Both federal and state governments are now setting by large tracts for forest reserves for all time. This is a wise policy both for the present generation and for generations to come.

Losses by Soil Erosion and Soil Exhaustion.

Uncle Sam no longer has a farm for every one. Unsettled land there still is, but little fitted for agriculture. The end of free land is in sight. The rapidly increasing population has practically absorbed the available free land. It is now a question of maintaining the productive power of the soil in an undiminished state, that it may feed the ever increasing population. The two causes of waste of land are erosion and soil exhaustion by wrong methods of cultivation. The former acts by washing away the fertile surface of the soil into the streams which sweep it onward to the seas. The annual estimated loss by erosion is 783,000,000 tons, or 610,000,000 cubic yards of surface soil. By deep tillage and surface protection through planting, much of this loss may be prevented.

The ruinous waste through soil exhaustion due to single cropping or insufficient fertilization, which has characterized farming in this country in the past, has resulted in a lessening of the productive powers of large areas of land. James J. Hill, in an address delivered at the White House Conservation Conference in 1908, said, after quoting statistics showing the decrease in the yield of wheat land in the previous 10 years in the states of New York, Kansas, and Minnesota:

> We perceive here the working of a uniform law independent of location, of soil, or of climate. It is the law of diminishing returns due to soil destruction. Apply this to the country at large, and it reduces agriculture to the condition of a bank whose depositors are steadily drawing out more money than they put in. What is true in this instance is true of our agriculture as a whole. In no other important country in the world, except Russia, is the industry that must be the foundation of every state at so low an ebb as in our own.

Intensive Cultivation of Farm Lands.

The history of all nations shows that in the early, undeveloped period of national existence when land is plentiful, wasteful methods prevail and are even economically advisable. It was so in the early history of this country. The day has arrived for intensive methods of cultivation. Splendid work is being done toward this end by the Department of Agriculture, the various state agricultural departments, and colleges. Opposed to the

law of diminishing returns due to soil exhaustion are the efforts of these bodies of scientific men. Better methods of cultivation, richer fertilizers, improvements in plants and grains, invention of labor-saving machinery, due to the application of science to industry, these, with the education of the farmer to more careful and intelligent effort, will not only maintain but also add to the productive power of the soil. Of all resources the soil is the most necessary. On it man depends for food and raiment; on the produce of the land all industry is based.

THE FACTS IN REFERENCE TO THE COAL SUPPLY OF THE UNITED STATES

In the dense swamps of the carboniferous age millions of years ago, nature began the manufacture of fuel for man. Deep pressed between the strata of the earth it has been in process of formation for countless ages. The early settlers who cleared the primeval forests to make their homes and farms little dreamed of the fuels and metals beneath their feet which were to play such a vital part in building up the new world. At the adoption of the Constitution in 1789, anthracite coal was looked upon as so much useless black stone, and the vast stores of bituminous coal lying in nature's subterranean storehouse were unknown. Practically none of the supply was touched for the first quarter of a century. The total amount used up to 1845 was 27,700,000 tons.

The Rapid Rate of Increase in Coal Consumption.

With the rise of the age of steam, and its insatiable hunger for coal, the figures tell a different tale. In 1846, 5,000,000 tons were mined; in 1875, the tonnage had risen to 52,000,000; in 1900, to 270,000,000; and by 1907, it had reached 480,000,000. The startling fact brought out by these figures is not the amount consumed but the extraordinary rate of increase of consumption. The increase of consumption alone of the year 1913 over the year 1910 was 130,000,000 tons—more than four times the whole production of coal up to 1845.

At this rate of increase it has been estimated that the production in 1937 would reach 3,500,000,000 tons. Since the war, however, the production of coal has not increased at its prewar

rate. The production peak for coal in the United States was attained in 1918 with an output of 678,211,904 tons. In 1919, it dropped to 554,000,000 tons; in 1920, it increased to 658,000,000; and in 1923, the output was again around 658,000,000 tons. This slowing up of the rate of increase may be but a temporary result of the retardation of industry by the World War, though it may partly be due to more permanent causes, as will be explained later.

All estimates of the probable length of life of the coal supply are liable to error; better methods of mining, revolutionizing inventions may eke it out beyond expectation. M. R. Campbell of the U. S. Geological Survey, in discussing the probable life of the coal fields of the United States, estimates that if the production were to remain the same as in 1913, the total coal reserves would last 4,000 years but that if the rate of increase of the past few decades continues until coal is exhausted, its life will be only 100 years. In summing up, he says:

> Although by every reasonable estimate the ultimate exhaustion of the coal reserves of the United States appears to be an event so far in the future that it need concern this generation but slightly, the fact must be remembered that the bulk of coal being mined today is the best in the country and that before long, perhaps within fifty years, much of the high-rank coal will be exhausted.

Long before that time, however, the coal shortage will cast its shadow before it in the shape of higher prices. It has been estimated that because of the progressive exhaustion of American coal fields, the consumer is paying 10 to 15 per cent more than if the supply were unlimited.

Conserving the Supply by Better Methods of Mining.

The right of the present generation to the use of a reasonable amount of coal is, of course, unassailable. It is the heritage of the nation and as such should be preserved for as many generations as its economical utilization will allow. Its conservation resolves itself into the elimination of waste. One of the most flagrant sources of waste has been in mining. The Geological Survey estimates that in mining practice about 1 ton of coal is lost for every 2 tons mined. It has been stated that of the total

quantity of coal produced for commercial purposes since mining began, amounting to over 5,000,000,000 tons, at least an equal amount has been left in abandoned mines. A further source of waste connected with mining is in the production of slack. At the pit mouth, thousands of tons have been burned. These wastes are being reduced through better methods of mining and the invention of furnaces burning slack as fuel.

Conserving the Supply by Inventions that Economize Its Use.

Much of the loss in this direction is being retrieved by inventions. The making of coke in beehive ovens is a reckless waste of coal. One authority has estimated that the waste due to beehive ovens in West Virginia alone in 6 months would amount to 10,000,000 tons. The replacement of these by the by-product coke ovens, which not only waste less coal but also produce valuable by-products, is helping to conserve the coal supply. It is said that 8 per cent of the coal used in the production of power, light, and heat, or 20,000,000 tons, is going up the chimneys each year in smoke. To prevent this waste would save not only coal but also human lives. The pollution of the atmosphere by factory fumes in our big industrial centers is a contributory cause of lung disease. In efficiency as a burner of coal, the gas engine is much superior to the steam engine. Wherever gas engines are used, the consumption of coal is almost cut in half. In the making of electricity, not much more than 1 per cent of the energy of coal is transformed into light. The substitution of water power for coal in the heating and lighting of cities has effected, and will effect, an enormous saving in coal. Over 30-000,000 horsepower is going to waste in our streams every day, much of which can, and will be, utilized, replacing coal. The development of water transportation will also tend to conserve the coal supply. Enough has been said to point out the tremendous saving possible by the elimination of waste in the mining and use of coal and to suggest the savings that may be brought about about by inventions that economize its use.

Rapid Rise of Other Forms of Power Energy.

Coal still remains the dominant source of power in the world today. Yet there are rivals appearing on the horizon who may

seriously threaten even the supremacy of Old King Coal before the sands of this century have run out.

Of the total energy supplied by mineral fuels in 1913, coal supplied 88, petroleum 9, and gas 3 per cent. In 1923, the supply furnished by coal had dropped to 76 per cent, while that of petroleum and gas had risen to 19 and 5 per cent, respectively.[1] In a recent paper in *Coal Age* by members of the U. S. Geological Survey, some facts are brought out which aptly corroborate statements made in the preceding paragraphs. Attention is called to the fact that since the World War the demand for coal is not growing so rapidly as before, if, indeed, it is growing at all. This is attributed to several causes. One is that business, in general, in the United States has not increased quite so rapidly as before 1918. Another is that owing to the high price of fuel, economy in the use of fuels has been greatly stimulated by improvements in fuel-burning equipment and greater care in firing. Beehive coking, which wastes 33 per cent of the heat of coal, has been largely replaced by the by-product process, which recovers all but 10 per cent. Consumption of railroad fuel has fallen greatly per thousand ton-miles. From 1917 to 1927, the consumption of locomotive fuel per 1,000 gross ton-miles declined from 176 to 131 pounds, a reduction of 26 per cent. Economies have been brought about in the production of pig iron. In 1913, it took 2,433 pounds of coke to make a ton of pig iron, whereas, in 1922, this was reduced to 2,176 pounds. The coal consumption per kilowatt-hour produced by electric utilities dropped from 3.2 pounds in 1919 to 2.4 pounds in 1923, or 25 per cent in four years, and by 1927 it had been reduced 42 per cent over 1919.

Another cause in addition to fuel economies is competition with other fuels and power sources. Members of the U. S. Geological Survey estimate that from April, 1919, to January, 1920, the quantity of coal actually displaced at plants that changed over from coal to fuel oil was less than 2 per cent. Other observers put the replacement at 5 per cent. But this actual

[1] TRYON, F. G., and L. MANN, "Coal," *Coal Rept.* by coal unit of U. S. Geol. Survey, 1923.

replacement does not show the large amount of potential new business which would fall to coal were there not other means of doing the same work. Gasoline is meeting a demand which would have fallen to coal, if not directly then indirectly, through the medium of electricity. New water-power developments have reduced by so much the demand for coal power. This invisible competition between the several sources of power is just as significant as the visible substitution of fuel oil in a plant built to burn coal.

Since 1918, while the energy produced from oil, gas, and water has increased, that produced from coal has decreased. The power energy produced from oil has increased relatively from 100 in 1918 to 205 in 1923, that is, it more than doubled in the space of 5 years. In the same period, water power increased 36 per cent and natural gas 40 per cent. In 1918, the heating power of all oil and gas to that of all coal was as 1 to 6; in 1923, the ratio had changed to 1 to 3. In 1913, of the combined supply of mineral fuels and water power, coal itself represented about 84 per cent, water power less than 4 per cent, and oil and gas together 12 per cent. In 1927, the share of coal had fallen to 64 per cent, while that of water power had increased to 7 and that of oil and gas to 29 per cent.

In view of the fact that since 1918 the total power energy consumed in the United States has increased relatively from 100 to 112, or 12 per cent, while the energy produced from coal has decreased, and taking into consideration the rapid increase in energy supplied by oil, gas, and water, it might be inferred that owing to the increased use of these new rivals the consumption of coal will not increase in the future so rapidly as in the past. With the progress of invention and the development of new fuels and sources of power, our coal supply will be economized and the danger of a coal shortage avoided. It should not be inferred from this that there is no further need of conserving our coal supply. We are dependent on it today and will be for many years to come for the bulk of our power, and whatever sources of energy science and invention may ultimately bring forth to take its place, it plays a dominant part in industry today, and economy in its production and use mean lower manufacturing costs and lower prices.

THE IRON RESOURCES OF THE UNITED STATES

This has been called the "age of iron." The structure of our modern civilization is built of iron. Our factories, buildings, machines, transportation systems are all based on iron; our fabrics, clothes, and food could not be produced without it. Of all the metals iron is the most useful. That and coal are the material foundation of our national prosperity. During the last 150 years, our industrial system has been forged out of iron with the use of coal.

The Figures for Seventy Years.

The United States has been producing pig iron during the last few years at the rate of about 30,000,000 tons a year; in 1916, it mined 35,000,000 tons—more than two and a half times the amount produced by Great Britain and nearly half as much as the rest of the world put together. In 1775, little iron was used. The per capita production in 1850 was 50 pounds; in 1880, 313 pounds; in 1908, 600 pounds. Up to 1906, the total amount of iron ore mined in the United States doubled every seven years. It was less than 12,000,000 tons in 1893; over 24,000,000 tons in 1899; 47,000,000 tons in 1906; 52,000,000 tons in 1907; and 61,741,000 tons in 1927. In the decade ending 1909, more than half of all the ore ever mined in the United States was extracted. Here, again, the ominous thing is the rapid increase of consumption.

An Expert Opinion.

The report of the National Conservation Commission, *Senate Document* 676, in discussing the probable life of the iron ores of the United States, sums up its conclusions in the following significant words:

> If the average rate of increase by decades, 108.7 per cent, should be continued it would require the production in the next three decades of 6,088,000,000 tons. But the ore supply now available in the United States is estimated at 4,788,000,000 tons which is only 78 per cent of the amount needed on this assumption. It is evident, therefore, that the present average rate of increase in production of high-grade ores cannot continue even for the next 30 years and that before 1940

the production must already have reached a maximum and begun to decline and a very large use must be made of low-grade ores not now classed as available. The second condition with its consequent greatly increased cost of iron is the only thing which can prevent a decline in the iron industry, measured by the amount of pig iron produced, within the next 30 years, unless there is in the meantime very greatly increased importation of foreign ores.

Thirty years is but a moment in the life of a nation. The bare possibility of an iron famine demands the strictest economy. This the big corporations, who own the ore deposits in the Lake Superior regions, fully realize, and, in consequence, they are mining them with great care. New deposits will doubtless be discovered. Stone and cement will be substituted for iron wherever possible. Ores of lower content will come into use and the home supply will be supplemented by imported ores from Brazil and Cuba. All that is possible to be done will be none too much, for though man can do many things he cannot make iron ore, and the nation's heritage of coal and iron, though generous, is far from unlimited. What is true of coal and iron is true of the minerals as a whole. The same waste in mining and use has marked the past; the same rapid increase in their production marks the present; the same limitation of supply looms in the future.

PRACTICAL CONCLUSIONS SUGGESTED BY THE FOREGOING STATISTICAL SURVEYS

Three striking facts stand out clear and sharp against the background of this great question:

First, the dependence of our industrial system on nature as its source of supplies.

Second, the sudden and unprecedented increase during the last fifty years in the rate of consumption of natural resources.

Third, the unmistakable appearance of the limited extent of the most essential of these resources.

These facts cry out, first and foremost, for concerted action on the part of government and people for the elimination of all waste. As we measure the life of nations, the United States is in its infancy. It is vital for the safety of its future pros-

perity that the present generation of producers be trained to a wise economy in the use of the resources on which that prosperity depends.

The Hope of the Future Lies in Science.

There is, however, another side to this question, which, perhaps, is not so obvious. While we bear in mind the limited extent of the resources on which our present economic prosperity depends, we should not forget that nature herself is unlimited. If the economic history of the last 150 years has taught us anything, it is that the part that nature is willing to play in production is limited only by the ability of the scientist to discover her hidden powers and the genius of the inventor to apply them. What is really limited is human knowledge at any one time. Just as in traveling the horizon recedes as we advance, so does the apparent limit which nature imposes on the economic progress of any age gradually move forward, revealing as it advances the wonders of the new age. As steam was the wonder of the last age, electricity is the marvel of this. In the last 100 years, the discoveries of science and invention have succeeded each other in rapid and orderly succession, revolutionizing our entire social and industrial system. What new powers and properties of matter will be discovered in the next 100 years is only to be conjectured. Nature is an unknown quantity in production. If coal and iron should eventually fail, our hope lies in the ability of science and invention to find in the mysterious realms of nature even more useful substitutes. A wise conservation of present resources, coupled with an active encouragement of industrial science and invention, will assure to the United States a continuation of that development which has, almost overnight, placed her in the forefront of the nations of the world.

Brief Survey of the Chief Resources of the United States.

The following chart presents a bird's-eye view of the relative position of the United States in respect to some of the most important mineral and agricultural products. The production of the United States in each case is compared to that of the country or countries producing the next largest amounts.

In 1927, the United States produced 80,649,000 tons of anthra-

cite and 519,796,000 tons of bituminous coal and lignite. The world's output of coal in 1927 was 1,625,893,000 tons of which the United States produced 600,445,000 tons, or 36.9 per cent. The total value of the coal produced by the United States in 1927 was $1,470,000,000. The United States exports of coal for 1927 amounted to 21,338,000 tons. As the chart shows, the next largest production was by the United Kingdom and Germany. The

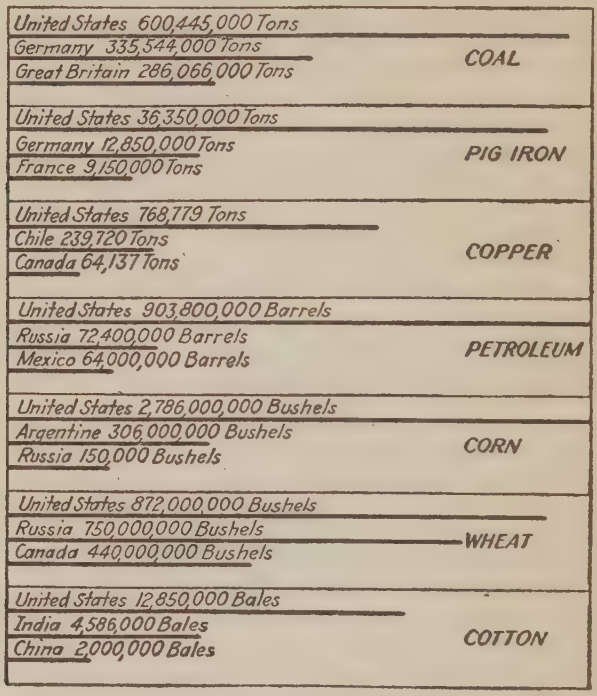


FIG. 1.

figures for Germany include territory now allocated to Czechoslovakia.

As with coal, so with iron, for the United States surpasses all other countries in the quantity of iron and steel which it produces, its annual output representing approximately one-half that of the entire world. Of this quantity by far the greater proportion is consumed at home, so that exports constitute but a

small proportion of production, and imports even smaller. In 1927, the iron ore mined in the United States is estimated by the Bureau of Mines at 61,740,000 tons, and the ore shipped from the mines was valued at $151,125,000. Of the ore shipped, about 84 per cent came from the Lake Superior district. In 1927, this country imported 2,621,000 tons of iron ore, principally from Chile, Algeria, Tunisia, and Cuba. Exports of iron ore totaled 899,000 tons. The world's supply of iron ore has been estimated at 31,800,000,000 tons with an equivalent iron content of 14,310,000,000 tons, which, on the basis of a pig-iron production of 70,000,000 tons a year, would be sufficient to last more that 200 years. This is much a matter of conjecture. Important deposits have recently been found in South Africa, Australia, India, China, Korea, and Japan. The resources of the continents of Africa, Asia, and Australia are not by any means known.

In 1927, the world's production of pig iron totaled 84,790,000 tons of which the United States produced 36,350,000 tons, or 42.9 per cent. The 1927 production of pig iron and crude steel in the United States was below that of either 1926 or 1925. Germany came next with a production of 12,850,000 tons, followed by France with 9,150,000 tons. In steel, the United States again leads the world with a production, in 1927, of 44,214,000 tons, or 44.7 per cent of the total world production of 98,904,000 tons. The most recent estimate of the American Iron and Steel Institute places the annual pig-iron-producing capacity of the United States at 49,808,320 gross tons, the steel-ingot-making capacity at 59,435,766 tons, and that for steel castings at 2,029,334 tons.

In the past century and a quarter, there has taken place a geographical shift in the production of copper, which is of great significance to the United States.[2] During the first half of the nineteenth century, Europe produced 63 per cent of the world's output; South America furnished 17 per cent; Asia, 13 per cent; and North America, 5 per cent. During the next 50 years, the North American output was 37 per cent of the world total; European production amounted to less than 30 per cent. In the first 25 years of the present century, North America produced 66 per cent; South America, 11 per cent; Europe,

[2] JULIAN, C. E., "Summarized Data of Copper Production," *Bur. Mines Econ., Paper* 1.

10 per cent; and Africa, Asia, and Australasia the remainder. Statistics for 1926 to 1927 indicate that North America still retains first place in world copper production with 61 per cent of the entire output. In view of the increasingly important part which copper is playing in modern industry, this geographical shift in the world's copper production toward the United States is both interesting and significant. Africa is the great new source of copper production, especially the Katanga deposits in Belgian Congo; but the United States production will continue to be the chief item in world production for many years, although its proportion in the world total may be expected to decrease slowly for a time, while the South American, African, and Canadian proportion will probably continue to increase. In 1927, the United States produced 768,779 tons of copper, which was 50.6 per cent of the total world production of 1,519,394 tons.

Considering the increased importance of petroleum as a source of power in industrial life, especially in the field of transportation, the United States is particularly fortunate in her possession of ample reserves of this valuable fuel. In 1927, there flowed from the wells of the world 1,252,145,000 barrels of crude petroleum of which 70 per cent or 903,800,000 barrels flowed from the soil of the United States. The output of crude petroleum in the United States has increased by leaps and bounds during the last fifty years. The average annual production for the period 1871 to 1880 was 12,519,000 barrels. By 1901 to 1905, it had reached 102,083,000 barrels. In 1920, the production was 442,929,000 barrels, while the 1927 production of over 900,000,000 barrels was the highest on record and was an increase of approximately 17 per cent over 1926. The rehabilitation of the petroleum industry in Russia during 1927 made Russia the second largest producer, displacing Mexico, which had held that position for the past nine years.

The foregoing brief summary suggests the relative richness of the United States among the nations of the world in the possession of the most important minerals of modern times. In respect to agricultural advantages, she is also much to be envied, as the figures on the chart for corn, cotton, and wheat indicate. In 1927, the United States harvested a corn crop of 2,786,288,000

bushels, valued at $2,014,725,000. It produced 871,691,000 bushels of wheat valued at $974,694,000. Of cotton it raised 12,950,000 bales worth $1,253,599,000. The following table, based on figures taken from *The Statistical Abstract of the United States*, demonstrates the remarkable growth of the nation in the last fifty years in the development of her vast mineral and agricultural resources:

TABLE I.—RAPID GROWTH OF THE UNITED STATES IN THE DEVELOPMENT OF ITS MINERAL AND AGRICULTURAL RESOURCES IN THE LAST FIFTY YEARS

Year	Farm animals	Wheat, bushels	Corn, bushels	Cotton, bales	Coal, long tons
1870	25,484,100	235,884,700	1,094,255,000	4,024,527	29,496,054
1880	33,258,000	498,549,868	1,717,434,543	6,356,998	63,822,830
1890	52,801,907	399,262,000	1,489,970,000	8,562,089	140,866,931
1900	43,902,414	522,229,505	2,105,102,516	10,123,027	240,789,310
1910	61,803,000	635,121,000	2,886,260,000	11,608,616	447,853,909
1920	63,369,000	787,128,000	3,232,367,000	12,987,000	576,431,250

Year	Iron ore, long tons	Pig iron, tons	Copper, long tons	Petroleum, gallons	Total minerals, value in dollars
1870	3,031,891	1,665,179	12,600	220,951,290	218,598,994
1880	7,120,362	3,835,191	27,000	1,104,071,166	364,928,298
1890	16,036,043	9,202,703	115,966	1,924,590,024	606,476,380
1900	27,554,161	13,789,242	270,588	2,672,062,218	1,107,031,392
1910	56,889,734	27,303,567	482,214	8,801,404,416	1,991,216,220
1920	69,558,000	36,925,987	539,759	18,622,884,000	6,707,000,000

Summary.

Nature as a factor of production plays a primary part in the production of all wealth.

Nature or "land," as the term is used in economics, includes all materials and forces provided by nature. The land areas provide a solid surface for man's activities, the lakes, seas, and rivers furnish waterways, and the atmosphere provides a vast space for man's aerial activities. The earth, sea, and atmosphere

also furnish the raw materials out of which all wealth is made—the chemical forces inherent in matter. Nature likewise gives the vital forces in living plants and animals. Man by his use of these natural forces has revolutionized industry.

The natural resources of a nation are vital to its prosperity. Each country inherits a limited stock of natural resources which when once gone can never be replaced. The facts show that the United States, though it has inherited a vast supply of coal, iron, lumber, and other natural products, owing to its rapid increase of population in the last century and its tremendous industrial expansion, has so increased its consumption of raw materials that they are proving to be by no means inexhaustible. It is highly important that the rich resources which have played a part so prominent in the industrial growth of this country be carefully husbanded by a wise policy of conservation.

Among the great nations of the world in respect to the possession of natural resources, the United States ranks second to none. She exceeds all other nations in the production of coal, iron, copper, petroleum, the most important metals and fuels of this age. With her varied climate, her extensive and rich lands, she produces great agricultural wealth, exceeding all other countries in the production of such important crops as corn, wheat, and cotton.

Natural resources alone do not make a nation prosperous, but in the hands of a vigorous, intelligent, commercial people they constitute the wherewithal out of which wealth is made at an advantage in competition with other nations.

Test Questions

1. Name the four factors responsible for the production of wealth.
2. What part does nature play in production?
3. What was the "error of the physiocrats"?
4. In estimating the length of life of a natural product such as coal or iron, of what significance is the increased rate of consumption?
5. What is the relation between the national resources and national wealth?
6. What is the situation today in the United States in reference to her supplies of lumber, coal, and iron for future use?
7. Why is a wise conservation of natural resources advisable as part of the economic policy of the United States?

References

CARVER, T. N., "Principles of Economics," Chap. XII.
CLAY, H., "Economics for the General Reader."
COMAN, K., "Industrial History of the United States."
CRONAN, R., "Our Wasteful Nation."
ELY, R. T., "Foundation of National Prosperity."
——"Outlines of Economics."
HILL, J. J., "Highway of Progress."
HOPKINS, "Our Country and Its Resources."
HUNTINGTON and WILLIAMS, "Business Geography."
MARSHALL, A., "Principles of Economics," Chaps. II, III, Book IV.
NICHOLSON, J. S., "Principles of Political Economy," Vol. I, Book I, Chaps. II, IV.
SELIGMAN, E. R. A., "Principles of Economics," Chap. XX.
SEAGER, H. R., "Principles of Economics," Chaps. III, VIII.
TARR, "Economic Geology of the United States."
VAN HISE, C. R., "The Conservation of Natural Resources."
Nat. Conservation Com. Rept., 1909.
Statistical Abstracts of the United States.
U. S. Industrial Com. Rept., X, XIX, 1902.
"Mineral Resources of United States, *Geol. Survey.*

CHAPTER III

THE NATURE OF THE PRODUCTIVE PROCESS

MAN AS A FACTOR IN PRODUCTION

The object of all production is the satisfaction of human wants, and the essence of the productive process is the creation of utilities in economic goods and services.

The term "utility" in economics means the power to satisfy a want. Any article or service that satisfies a want is said to possess utility.

It has been said that the industrial prosperity of the nation is based on natural resources. It is evident, however, that nature does not supply these resources in such manner as fully to satisfy man's wants. At favored localities in the tropics, nature may have furnished barbaric man with sufficient goods to satisfy his simple wants, in return for little labor. In colder regions, it always required hard work on the part of man to provide food, clothing, and shelter; and in modern civilization, the crude materials of nature fall far short of satisfying man's varied and cultivated tastes.

Today, the typical finished product is vastly different from the raw material from which it has been made. A derby hat has no apparent relation to a rabbit, neither does a plate-glass window suggest sand, nor a steel girder, red ore dust. Materials gathered from the four corners of the earth enter into their composition, and in the various stages of production through which they pass, much labor and skill are required to effect their transformation into products suitable to our needs. So it may be said that the production of wealth in most civilized countries today consists largely in adding utilities to the raw materials supplied by nature. And if the various institutions, workers, and activities that comprise the economic system of any great nation are analyzed, it is found that the bulk of them are engaged

directly or indirectly in adding utilities to the raw materials secured from its forests, farms, mines, and seas.

Complexity of Modern Production.

Modern production is a much more complicated process than most of us realize. The term "production," in the mind of the average man, means manufacturing or farming. Yet in the manufacture of any modern product a large number of auxiliary agencies are involved outside of those engaged in its "manufacture" in the narrow sense of the term. A shoe factory is spoken of as "making" a pair of shoes. But if the facts are examined, it is found that the modern shoe plant carries out but a small part of the work necessary to produce a pair of shoes under our modern complex system of production.

A visit to any shoe factory will soon disclose the interesting fact that the materials that enter into making a pair of shoes are gathered from all parts of the world, and their production involves a whole range of different industries—tanneries, cattle ranches, sheep raising, dye manufacturing, lumber companies, textile mills of all kinds, cotton plantations, nail mills, and so forth. One of the most striking things about an up-to-date shoe factory is the number and variety of ingenious machines which have completely replaced the human hand in the making of footwear. This takes us to the shoe-machinery industry and thence to the iron and steel industry, which is based on the coal and iron industry. In all of these, scientists, engineers, and inventors are employed in the improvement of processes and the invention of machinery. The transportation agencies of the world—steamships, railroads, trucks—have been used to bring these raw materials and machines from the various places where they have been made to the factory where they are to be assembled in the manufacture of shoes. Still the shoe factory has not finished the production of shoes, for it must yet sell its product. The shoes are not fully produced until they are in the possession of the users, and these may be scattered over the whole continent. The shoes are likely to be distributed to the users through the agency of middlemen, and this will require the cooperation of the various agencies that constitute our marketing system—wholesalers, retailers, and so on.

All of these various operations will have had to be financed. Capital has had to be raised, money and credit has had to be borrowed, and the shoe factory as well as the numerous other businesses involved have been dependent right along on the various institutions constituting our banking and credit system. Other branches of business have rendered important services, such as insurance agencies, accounting concerns, but enough has been said, perhaps, to suggest that the production of any commodity in the United States today, from the extraction of all the raw materials that enter into it to the delivery of the finished product into the possession of the consumer, when it becomes a consumption good, is a complex process, involving, besides the direct work of manufacture, a variety of agencies contributing specialized services, which, though indirect, are highly productive and play an essential part in the capitalistic mass system of production for which the United States is famous.

Three Kinds of Utilities in Production of Wealth.

In the science of economics it is usually said that there are three kinds of utilities created by all of the agencies and individuals engaged directly and indirectly in the production of wealth, namely: utilities of form, place, and time. Someone has said that things are not produced until they are in the form wanted, at the place wanted, at the time wanted. The extractive, genetic, and manufacturing industries are typically engaged in creating form utilities. The transportation systems of the nation, which do not make anything in the narrow sense, are productive in that they create both place and time utilities by carrying things from place to place in the shortest possible time. While the physical transportation of commodities is handled by the transportation agencies, the distribution of goods from the comparatively few places where they are made to the millions who use them is brought about through the services of merchants and middlemen, who are thus engaged in the creation of place and time utilities. The storage industries are typically engaged in the creation of time utilities. Any institutions or individuals which aid in any way in the creation of these three kinds of utlities are performing productive work.

Service Utilities in Wealth.

But what of the great army of persons who are engaged in performing direct personal services, such as doctors, teachers, or musicians; are not these producers? They are usually credited with being producers of personal services as distinct from producers of wealth. It would be manifestly ridiculous to claim that the maker of a piano was a producer while the piano player was a non-producer. But is not the piano player also a producer of wealth in the essential meaning of the term? According to most definitions in economics, the term "wealth" is limited to material things and excludes personal services. The chief reason for the exclusion would seem to be that material things are more permanent, while services are used up at the moment of performance. But many kinds of material goods are not capable of being stored for any appreciable length of time and are exhausted in the one use, while the value of many personal services is lasting. Material things are valuable for the same reason that personal services are, because they satisfy human wants, and they satisfy those wants in essentially the same way by performing a service. The service performed by the material commodity constitutes the essence of its value and, therefore, its claim to wealth, and yet the title of wealth is denied to human services which satisfy wants directly. The Victrola record is bought for the sake of the music it furnishes, and the record is classed as wealth, yet that the performances of the artists at our operas constitute part of the wealth of the nation is denied, unless, of course, these result in records, in which case the artists may be said to be engaged in creating form utilities and, therefore, to be producers of wealth.

It would seem to be truer to the real nature of things to define wealth as consisting of all those things which possess utility, are scarce, and are transferable. This excludes human abilities being considered wealth, as these are inseparable from their owners, who are not allowed by law to be bought and sold in civilized countries. Wealth will consist of all valuable things external to man himself, including human services.

Now, if a fourth utility is added, which will be called a "service utility," the economic status as producers of wealth, of that large section of our population which is performing valuable

services direct to consumers, can be established without question. Doctors, lawyers, teachers, actors, musicians are productive workers in that they are creating service utilities. Production may be defined as the creation of utilities in wealth or the creation of utilities in economic goods and services. The process is a highly complex one, consisting of specialized activities of a multitude of diverse agencies and individuals all of which are contributing to production by creating form, place, time, and service utilities.

Man the Active Agent in the Production of Wealth.

Of the four basic factors on which the production of all wealth depends, human labor, or man, plays the active directing part. Nature supplies the raw materials and forces, capital augments the labor of man and enables him to utilize natural forces to an extent never before dreamed of, organization tremendously extends his control over the work of production, but it is from the intellect of man that the two last factors have sprung. Though the importance of science and invention in modern industry is universally recognized, the vital nature of the labor of science and invention and its fundamental relation to our economic progress have not received the attention which they deserve.

THE FOUR PARTS PLAYED BY LABOR IN OUR INDUSTRIAL SYSTEM

When man obtained his supplies from wherever he happened to be and worked them up himself with the aid of a few rude tools, the part that labor played in the process, though all important, was simple and direct. The relation of labor to modern production is not so simple. Some of the most vital questions of the day grow out of the relationship of labor to production, and their solution demands a clear understanding of the nature of the services performed by labor in our present complex industrial system. The product which was formerly completed by the labor of one man producing in small quantities for himself is now made in large quantities by the combined labors of numerous

other men. Commodities are not produced by individuals working separately but through organized effort. They are not produced directly by hand but by machinery which must itself be made. This invloves long-time, indirect processes and a complicated system of exchanges. In this transformation of natural resources into finished products, under the present large-scale, organized capitalistic system of production, the function of labor may be divided into four stages. There are four acts in the drama of production, and in each, man assumes a different rôle.

1. The Labor of Pure Science—Man as a Discoverer of Natural Products and Forces.

Production begins with the discovery of the forces and properties of matter and a knowledge of the laws which govern their use. The manufacture of stone implements by primitive man began when he found out the hardness and sharpness of broken stone. Later, the discovery of fire and metals increased his productive power. The history of the industrial progress of the race is largely an account of man's discoveries of new natural forces and resources. The age of stone was followed by the age of bronze, which, in turn, gave place to the age of iron.

For thousands of years, coal lay useless in the earth. Its discovery as a fuel, coupled with a knowledge of the power of steam, marked a new industrial era. Man's gradual mastery of the laws governing the action of these materials and forces has been the primary cause of his advancement in the arts of industry.

No doubt, man's early discoveries were the results of chance and accident. By chance, he found that certain stones when struck emitted a spark and so would produce fire at will. By accident, he found that new seeds and roots were edible and added to his food supply, as later Sir Walter Raleigh added to the menu of Europe when he introduced the potato from North America. By accident, the native of Brazil found the juice which oozed from the india-rubber tree and used it to protect himself from the tropic showers or to play ball with on the sands of the Amazon. The early knowledge of mankind was the result, for the most part, of random thinking or haphazard experiment.

Although in the most remote times man utilized chemical ac-

tion in the extraction of metals and in the arts of tanning and dyeing, there is no evidence to show that there was any real knowledge of the nature of the processes involved. Up to the seventeenth century little was known about chemical forces. The old alchemists were absorbed in their search for the philosopher's stone, which they fondly believed would turn the basic metals to gold. With the discovery by John Dalton, in 1808, of the laws governing chemical combinations and the theory of valences of Frankland and the work of Lavoisier and others, the basis of modern chemistry was laid. Haphazard thinking and experimentation gave place to scientific research, and man gained an insight into the forces and properties of matter which has opened up a new world for him. The services of the chemist to modern industry can scarcely be estimated. There is hardly any branch of the industry which has not benefited by his labor; out of waste he brings profit; from coal tar he extracts dyes, drugs, oils, perfumes as the conjurer produces rabbits from a silk hat. If the natural supply of an article fails, the chemist makes it synthetically. The laboratory has become an invaluable department in the modern plant.

In the same way, other sciences are exploring nature's powers and are bringing to light new wonders. Over 2,000 years ago, men knew that amber and jet when rubbed possessed the power of attracting fragments of straw, leaves, and feathers. But it was not until Gilbert laid the foundation of modern electric and magnetic science on the true experimental and inductive basis that production was furnished with a new source of power. The labors of Gilbert, Volta, Faraday, Clerk Maxwell, and other scientists, into the nature of that mysterious and versatile force which we call "electricity," have paved the way for the revolutionary changes which have been wrought in industry by its diversified application. The scientist plays the leading part in the first act of the drama of production. He it is who does the pioneer work, exploring the hidden recesses of nature for new materials and powers. With microscope and test tube he penetrates the heart of things, analyzing, experimenting, measuring, recording, that those who follow him may be equipped with the accurate knowledge necessary for efficient production.

2. The Labor of Invention—Man as an Inventor of Machines and Processes for the Utilization of Natural Resources.

The second stage of production consists in the application of the discoveries of science to the arts of industry, by the invention of machines and processes. Here the inventor plays the leading part. The scientist discovers the laws governing the action of steam, gases, and electricity; the inventor harnesses them to machines to perform the work of industry. After the Gilberts and the Voltas come the Bells and the Edisons who carry a stage further the labor of the pioneers. The genius of the inventor devises the means whereby this versatile power transmits the human voice along the copper wire from continent to continent; heats our furnaces; lights our darkness; whisks us to the top of our tall buildings; drives the machinery in our plants; pulls our trains over the mountains; or cures our diseases. After Hertz ascertains that electric waves travel through the ether, Marconi invents the wireless telegraph to transmit messages across the seas.

Not only does invention aid industry by furnishing the machinery to make effective the powers of nature but also by devising new processes and combinations of matter. The scientist discovers the existence of chemical affinity and the laws governing chemical compounds; the industrial chemist puts these to use by inventing improved processes for the reduction of ores, for making steel, varnish, yeasts, gases, oils, fuels, and a thousand other things. If the manufacturer requires a metal of a certain lightness, hardness, toughness, conductivity, the metallurgist invents a new alloy. The application of the discoveries of pure chemistry to the practical problems of manufacturing is achieving wonderful results in the elimination of waste and in increasing commercial efficiency. In the realm of biology, the laws governing evolution and heredity have been used by agriculturists to produce new varieties of plants and animals better suited to the needs of man. If the high winds on the Kansas plains destroy the farmers' wheat, the experts of the Department of Agriculture produce a new variety with a wiry stem able to withstand the storm. By improved agricultural processes and fertilizers the

yield of some lands has been doubled and trebled and the average yield of the whole increased.

The Coordination of Science and Invention Promotes Progress.

Science and invention act and react on each other. Before the printing press was invented the greater part of the knowledge of one generation was buried with its bones. The labor of Caxton provided the world with a means of recording its discoveries, so that now knowledge grows from age to age with cumulative force and each new generation is endowed with the wisdom of past ages and starts its labors where they left off. By the inventions of modern transportation and communication, knowledge is flashed from one part of the world to another. This rapid interchange of ideas speeds up progress. The nation turns over its mental capital oftener. The results of scientific research quickly materialize into invention and invention is speedily utilized in industry. The different stages in the progress of production are being linked more closely together. The long intervals between the acts are being shortened, advancement is more rapid. The Industrial Revolution of Great Britain is evidence of the remarkable acceleration of industry due to the rise of science and invention. Germany's rapid ascent from a second- to a first-rate power in the last 50 years was brought about by her thorough development of scientific research and invention and their close application to her industries. The progress made in the later stages of production is largely dependent on the foundation work performed by the scientist and inventor. This fact modern business is recognizing, with the result that the scientist and inventor are actively cooperating in our big plants in the production of commodities.

3. The Labor of Organization and Management—Man as an Organizer and Director of Industry.

The work of science and invention, though of fundamental importance, is but preliminary to the actual making of the product. It is one thing to invent, it is another successfully to manufacture and sell that invention or the product made by it. The production of any commodity today is a complex undertaking, requiring not only the knowledge of science and invention

but also ability to organize and direct on a large scale all the factors of production. In order that the discoveries of science and invention may materialize into commodities or services, the organizing genius of the entrepreneur is necessary. When the craftsman worked in his own home, with simple tools, supplying his own small capital, producing for a local market, the part that organization and management played in production was comparatively small. Under our present large-scale system of production, with its intricate division of labor, involving an extensive labor force, expensive machinery, factory buildings, big capitalization, volume production for a world market, organization and management play an indispensable part.

This dual function of labor is sometimes performed by two separate individuals or groups, in which case one group of men performs the work of organization, after which others step in and carry on the work of direction. More often, both functions are performed by the same set of men, who first create the organization and then direct its operations. By their efforts the separate factors of production are coordinated into an effective working unit. They take the initiative, and as a result of their enterprise, the discoveries of science, the machine of the inventor, the money of the capitalist, and the labor of others are employed in producing commodities or services. They shoulder the responsibility, and on their labor the success or failure of the enterprise largely depends. They decide what products shall be manufactured, the amount of capital required, the location of the plant, its equipment with machinery, and the number and character of the labor force. They determine the policies of the company and administer them through their appointed executives. They departmentalize the organization, select the department heads, and supervise the manufacture and sale of the product. They finally collect the money and disburse it as their judgment dictates. They are the generals and captains of industry, and their work demands a high order of ability.

The organization and management of any business requires not only a knowledge of that particular branch but also a comprehensive grasp of those broad principles which underlie business as a whole and, above all, a keen insight into human nature. These leaders range from the chief executives of huge corpora-

tions down to their most humble subordinates and the heads of small individual businesses. Their influence on the industrial efficiency of the country is tremendous. The part that intellectual labor plays in organizing the processes of production is of paramount importance.

4. Direct Labor—Man as a Performer of the Physical and Mental Work of Production.

In the last act of production, the curtain rises on the workers who, under the direction of the management, make and complete the product. These constitute the rank and file of the industrial army, its salesmen, clerks, mechanics, semiskilled workers, and laborers.

It is evident that the great bulk of the detailed work of production is performed by this class of workmen. They manipulate the tools, tend the machines, fashion the materials, or perform the services which result in production. They furnish the technical and mechanical skill as well as the manual labor. Not only do they tend the machines, but, also, their labor helps to make those machines as well as the capital goods used in production. They are indispensable to production; if they did not play their part, there would be no wealth produced.

Summary.

Man as a factor in production supplies the physical and mental effort necessary for creating the utilities in economic goods. In the tranformation of natural resources into finished products, he performs four main functions. First, he obtains a knowledge of the laws and properties of matter by scientific research. Second, he applies that knowledge to the arts of industry by inventing new machines, processes, or combinations of matter. Third, he organizes the factors of production and directs their work. Fourth, he performs the routine work of production under the direction of the management. In primitive times, the labor of one man performed all four of these functions in an act of production. Today, they are usually undertaken by four different sets of workers, who, with the aid of capital and organization, cooperate to produce commodities or services.

Test Questions

1. State the four functions which man's labor performs in modern production.
2. Why should a country for economic reasons recognize and encourage the labors of scientists and research workers?
3. Do you know what policy Germany pursued along this line previous to the war? Have you noticed a tendency in this direction in this country recently?
4. What is the relation of invention to industrial progress?
5. How do the people of the United States compare with those of other nations in reference to inventive genius?
6. Name six notable inventions produced in the United States within the last 50 years.
7. Why is it that some inventors fail to derive any pecuniary reward from their inventions?
8. What further ability is required in order to render an invention of service to the nation at large?
9. What function of labor is performed by the great mass of men?
10. Show how the four classes of workers cooperate to produce wealth.

References

CARVER, T. N., "Principles of Political Economy," Chap. IX.
FARRELL, HUGH, "What Price Progress?"
FETTER, F. A., "Economic Principles," Part III.
GIDE, C., "Political Economy," Book II, Chap. II.
HOPKINS, N. M., "The Outlook for Research and Invention."
MAROT, H., "Creative Impulse in Industry."
MARSHALL, A., "Principles of Economics," Book IV, Chaps. IV, V, VI.
MARX, K., "Capital," trans. by Aveling, 1887, Chaps. XIII–XIV.
NICHOLSON, J. S., "Principles of Political Economy," Book I, Chap. V.
PHILLIP, A., "The Function of Labor in the Production of Wealth."
SAY, J. B., "Political Economy," Book I, Chap. VII.
SCOTT, W. D., "Increasing Human Efficiency in Business."
SEAGER, H. R., "Principles of Economics," Chap. IV.
SELIGMAN, E. R. A., "Principles of Economics," Chap. XIX.
SLOSSON, E. E., "Creative Chemistry."
TAUSSIG, F. W., "Principles of Economics," Chap. III.

CHAPTER IV

THE QUALITIES DETERMINING THE EFFICIENCY OF LABOR

The consideration of natural resources is only preliminary to the larger question of national economic efficiency. History has repeatedly shown that the wealth of nations is neither limited nor determined by the extent of their natural resources. Compare, for instance, Germany and Russia, Japan and China. The source of national, as of individual, wealth lies not in material possessions but in mental forces. As we have seen, strip the productive process to the waist, and man remains as its final cause, as its primary dynamic agent. Not from its great cities, its fine buildings, its huge factories, its wonderful machinery does the wealth of any nation originate but from the men and women by whose united efforts all these came into being. Increase the efficiency of the men and women of the nation and you increase the production of wealth at its source. An ounce of effort here is magnified into a ton of result in the product. There is no other question so vital to the general welfare of the nation as the economic efficiency of its people.

The Meaning of Human Efficiency.

Efficiency is a ratio between equipment and work done. A 70-horsepower machine developing only 35 horsepower is 50 per cent efficient; developing 70 horsepower, it is 100 per cent efficient. To attempt to get 80 horsepower would endanger the machine. Efficiency aims to get 100 per cent from every machine, no more, no less. The object of economic efficiency is to develop 100 per cent efficiency in the national production machine. This requires that each individual worker should develop 100 per cent efficiency, no more, no less. There is as much difference in the capacities of men as of machines. Some men are born with a

35-horsepower, others with a 100-horsepower equipment. Harm is done to the man who is forced, or who forces himself by an inordinate ambition, to work his machinery beyond its capacity; but, on the other hand, the man who is only getting 40 horsepower from a 100-horsepower machine is clearly losing the greater part of what he might be making every day of his life. The problem before the nation in developing its labor power to maximum efficiency involves finding out the present efficiency of the individual worker, his potential capacity, and the principles and means through which his latent powers may be developed to 100 per cent.

Measuring Human Ability.

This is a problem of no mean order, for although we have borrowed the terminology of engineering, the task of the human engineer is infinitely more complicated. A few years ago, it would have been impracticable. The recent experimental work of applied psychology has brought it, however, well within the realm of accomplishment. It is primarily a mental problem. The part that human labor plays in production is increasingly mental. Man is more and more relegating to machinery physical labor, he himself performing only the slighter physical effort necessary to control the machine. It is the trained mind that counts in modern production. The practical trend of twentieth-century psychology is rapidly dispelling the mists which have for ages shrouded the human mind and its operations. The cooperative research work at present being conducted by psychologists and business men, who together are searching for the mental factors responsible for success and failure in selling, clerical work, management, and other lines, is resulting in a very much clearer analysis of the elements of native ability. Rapid strides have been made in applying this knowledge to the testing and training of men for various lines of work. Business men everywhere are eager for this information. The psychologist is rendering signal service to industry; and he bids fair to contribute in the near future data of even greater importance. Mental measurement is one of the latest developments of applied psychology. Psychological tests have been prepared for the purpose of determining and measuring the mental powers

of men. While these tests are yet in an experimental stage, enough good has resulted to establish their value. Several corporations are using them in hiring salesmen and bookkeepers, and in adjusting their labor force to the best advantage. Similar tests have been used by the U. S. Army to assist in finding out what lines of work different men are fitted for.

Great Possibilities for the Development of Latent Mental Powers.

The results of these tests, reinforced by the observations of psychologists and efficiency men, indicate that the average man is about 40 per cent efficient. The consensus of expert opinion certainly points to the fact that the great mass of men are working up to only a small part of their capacity. This opens up, then, a vast mine of latent power to be developed for productive purposes. What it means to the wealth of the nation is incalculable. It means very much more than increasing the present annual production 60 per cent. An increase of 60 per cent in the mental efficiency of a worker may double or treble his product or, if applied to invention and improvement in organization, may indirectly magnify the productivity of thousands of others. We are dealing now with productive efficiency at the source. The next question is, What are the factors on which the efficiency of labor depends, under our present system of production?

Discovering the Basic Qualities Determining Success.

It may seem at first flush that any general discussion of this question has little value, owing to the fact that the qualities that make for productivity in one line of work may not insure success in another; that an accountant requires a different order of ability than an advertising man. The difference is more apparent than real. There are certain fundamental requisites for success in all callings. Each line of work may emphasize a particular quality or set of qualities; one may lay special stress on memory, another on constructive imagination, so that the exact proportion of each of these, fitting a man for a particular task, may vary. Imagination is just as necessary to the head of a big business as to an inventor. Ability to analyze is important

equally to banker and sales manager. But both use these powers in a very different way. Success in all lines of business activity is based on a few certain well-defined personal factors. Any man of average ability, genuinely desirous of becoming proficient by developing and training himself in the exercise of these, in whatever line of work he takes up, will achieve success just as surely as the sun rises.

Physical Vigor First.

The basic factor is physical health and vigor—not mainly for its direct application to manual labor, as in olden times, but for its influence on the mental faculties and its generation of energy, the motive power of the mind. The machinery of the mind depends on power, just as does all other machinery. Independent of the mental equipment of a man, the amount and quality of the work that he will do depends on mental energy, which, in turn, is based on physical health and vigor. Not only as a source of mental energy is health important but also for its physiological effects through the nervous system on all the mental processes, including the emotions, which are of great importance. The way one feels has a great deal to do with the way one works; good health with its accompanying exuberance of spirits is worthwhile if only for its influence on one's disposition.

Ill health, itself an expense to the individual and the nation, is, of course, directly disastrous to industrial efficiency. The yearly loss to the nation in industrial efficiency due to ill health alone is estimated at approximately $750,000,000. Yet the more important aspect of this factor is not the negative but the positive, the great potential increase in productive power which would be realized by an increase in the physical health and vigor of the nation, and the resultant quickening of the mental activity on which modern productivity mainly depends. The unanimous testimony of the great captains of industry such as Gary and Schwab, who place health first on their lists of the qualities underlying industrial efficiency, backs up with insurmountable empirical evidence the causal relation between good health and national economic efficiency.

For the individual worker, in whatever part of the economic system he is working, good health, abundant health, should be

everlastingly sought. The keen strain of modern competition, the high speed of industrial processes, the insistent and continuous demands of progress for improvement and change, all result in driving the worker to intense effort during his working hours. To compete successfully in this struggle, the individual needs all the vigor and reserve power that he can muster. A strong body, splendidly healthy, will best equip him for action. Not to be merely well but to be superbly healthy should be the constant aim of each individual worker.

The Driving Force of the Mind.

The second factor in economic efficiency is mental energy, about which we have already spoken in its relation to health. Mental energy, however, is not dependent on the physical alone but is a product of both the mind and the body. Desire, purpose, and will all have a hand in generating and liberating energy. A perfectly healthy man may be disgracefully unenergetic through lack of ambition. Once fired with a purpose, he becomes a veritable dynamo. All creative work, whether in art, literature, advertising, or selling, consumes large quantities of this life force. Deficient energy is the direct cause of more unfinished tasks than, perhaps, any other one thing. The life of a mentally anemic man is strewn with the wrecks of abandoned jobs which have miserably perished for lack of the energy to complete them. This energy is the driving force of the mind, the source of intense and long-sustained effort. Yet the average man uses but a fraction of his possible power. He runs on third speed. In most men there are reserves of power, never drawn on, never dreamed of. The extent of this latent power in a nation opens up an interesting field for economic speculation. Of what this lost power amounts to in the tremendous reservoir of the national mind no adequate conception can be formed. But one thing is certain—that in its development lies a mine of wealth for the individual and the nation alike.

THE INTELLECTUAL PROCESSES—OBSERVATION—MEMORY—IMAGINATION

Given a sound body, vibrant with health, generating ample power, the productive efficiency of the individual next depends

on the intellectual faculties or processes by means of which the mind gathers the materials for its thinking, stores them up, organizes them into conclusions, and, in general, performs its varied tasks. These are the working factors underlying mental ability. The first in order of activity is observation, the searchlight of the mind. Accurate observation forms the first step in all good thinking. It is of direct practical value in all lines of work. Shoddy reasoning and faulty conclusions are frequently due to defective observation. To the scientist in his collection of data, to the salesman in interviewing prospects, to the accountant in systematizing and recording; in fact, to all men in whatever they are engaged, the power to observe carefully and accurately is of primary importance. Psychological tests seem to indicate that the average man is not more than 40 per cent efficient in observational power. While the exact percentage cannot be determined, the fact that the great mass of men are bringing to bear on their tasks only a small part of their possible powers in this respect is undoubtedly true.

The next factor is memory, whose function it is to retain and recall when required the facts observed. Memory is the storekeeper of the intellect, receiving the raw materials and supplies from the purchasing agent, storing them up, and giving them out on requisition for the use of the other departments such as imagination and reason. A poor memory means a constant loss of valuable stock. Knowledge means power in modern business. The man whose acquisitions stick, he who is able to recall at will apt and convincing data, is well equipped for effective service. Yet the learning of new facts is, with a great many men, like filling a bucket with a hole in it. Memory is a basic factor in productive efficiency and any improvement in individual memory will result in a marked increase in national efficiency.

If observation and memory supply the mind with the raw materials of thought, it is the function of imagination to work them up into new products. Imagination takes the ideas stored in the mind by memory and recombines them into new wholes. It is the originator of new ideas. Long recognized as responsible for the creative work in art and literature, its economic value has only recently been emphasized. All constructive work, all invention, all organization involves the use of the mental process

which we call "imagination." A man lacking it may be a good routine worker, but he will never become a leader. Business leadership requires the power to originate new plans, to devise new processes, to foresee and anticipate coming events. Ideas are at a premium in modern business. In advertising, selling, and the organizing and managerial end of production, men with ideas are in urgent demand. Ideas are the very seed of business progress. Every great corporation of today once existed as an idea in the mind of some man, just as every new step in its progress was first projected on the mental drawing board of those engaged in its upbuilding. This power of mental projection, called imagination, is a fundamental requisite for productive efficiency in the modern worker. Though not so much is known about the nature of this faculty as is known about memory, for instance, it is capable of development, and practical methods have been devised by psychologists for its cultivation.

Logical Use of the Intellectual Processes.

Reasoning is a complex process involving the use of the preceding factors. By means of it we arrive at our judgments and conclusions. Sound judgment is an essential part of executive skill. The power to reason out a problem in marketing, management, or financing constitutes the high-water mark of business ability. The most vital element in reasoning is the ability to analyze out of a thing its essential characteristics. "A genius," says Carlyle, "is he who sees the essentials of a thing and leaves the rest as surplusage." The reasoner searches into events for cause and, connecting cause with effect, formulates the principles which insure success in the work he is doing. Business activities are governed by law. There are always reasons for a man's rise in business life, just as there are always reasons for his failure. The successful conduct of business today demands a knowledge of underlying principles. While some of these are already known, others remain to be reasoned out. Never in the world's history has there been such an imperative demand for trained thinkers as today. Drastic internal changes are taking place, and probably still more radical changes will take place in our economic system as a result of postwar conditions. Old customs are going by the board. New methods will spring up overnight.

Unprecedented situations and problems will arise the peaceful solution of which will demand a keen analysis of facts and the wise application of fundamental economic principles.

Intellectual Control.

The last of the purely intellectual factors is concentration the essence of which is fixation of attention. Power of concentration consists in one's ability to focus all one's faculties on one thing to the exclusion of all else. The habit of the immediate direction of our powers to one problem, with its complement of immediate relaxation when that task is finished, is invaluable in all lines of work. More will be accomplished in 20 minutes of concentrated effort than in 2 hours of ordinary work. Concentration is a habit that can be acquired through practice.

PERSONAL CHARACTER TRAITS MAKING FOR ECONOMIC EFFICIENCY

In addition to the foregoing intellectual factors, there are certain well-defined character factors having a definite bearing on economic efficiency. A man may be clever intellectually, but if deficient in "stick-to-itiveness" he will accomplish little, while a worker of mediocre ability, gifted with uncommon perseverance, will outdistance the man of spasmodic brilliancy as the tortoise did the hare in the old fable. Keeping everlastingly at it brings success in business as certainly as it does in all other spheres of activity. Honesty is another essential. The cooperative character of present-day production necessitates interdependence. There is no depending upon dishonest men. Confidence and faith are at the basis of modern business and are distinct assets to the individual as well as to the nation. The cooperative nature of production demands, also, that each individual possess the ability to get along with others. Just as on a football team, so in the business game, star players are not so desirable as those who will work hand in glove with the others. It is teamwork that counts in cooperative production. He who cannot obtain the goodwill of his work mates, whether he be employee or manager, is inefficient. For he will get less work out of others, while handicapping himself. Interdepartmental

cooperation, so necessary to the success of the large corporation, is impossible if men do not work together in harmony, and many an otherwise good department head has lost his seat in the saddle for lack of ability in this direction.

Initiative, the power of original thought and action, is a quality necessary to those holding positions of authority or to those aiming to reach the managerial end of business. He who does not need to be watched or ordered to do every little thing but who is capable of thinking ahead and acting on his own initiative is an asset in any organization. Courage and self-confidence go hand in hand. For all our standardization and system, there is an element of risk, varying in degree, in different lines of business. The purchasing agent, the sales manager, or the organizer stakes his success on his judgment. It requires nerve to authorize an advertising appropriation running into half a million dollars or to sink a million dollars into fixed capital. Successfully to assume responsibilities necessitates self-confidence. Competition for position is keen. The nature of the work required is often difficult, and in many cases the ability of a man to accomplish that work will depend on his belief in himself.

Last, but not least, is ambition, the most dynamic factor of all—the accelerator of the human machine. Without it a man is but a hulk on the business seas. We have seen that most men have reservoirs of hidden energy, seldom, if ever, utilized. The driving power of ambition uncovers these hidden wells, revealing latent powers of which they had never dreamed. Men hate to apply the spur, to energize at their maximum. In nine cases out of ten, love of ease, laziness, indifference, mediocre effort are due to lack of amibition. It takes a deep-seated purpose to get the best out of a man, and the productive efficiency of men is more dependent on ambition than on any other one factor.

The Well-informed Mind.

In addition to the factors already discussed is knowledge. Knowledge is to personal ability as the shot in the shell is to the powder. The effectiveness of the shell depends on a proper combination of both, just as the efficiency of a man as a producer depends on his knowledge plus his ability to apply that

knowledge. Roughly speaking, we can divide knowledge into two kinds: First, that general knowledge which goes to make a well-informed, broad-minded man. Second, the technical or specialized knowledge which equips him for his particular work. The extent, character, and availability of knowledge in any nation have, therefore, an intimate bearing on its economic efficiency.

PRACTICAL APPLICATION OF SCIENTIFIC ANALYSIS OF HUMAN ABILITIES

The rise of personnel work in the last few years has clearly proved the dollar-and-cents value of a careful study of the workers in plants in relation to the tasks which they are to perform, and the productivity of labor in plants has been much increased. To the individual it often makes all the difference between success and failure whether or not he chooses a line of work to which his special abilities fit him. When an individual is not fitted to the work he is doing, or is not doing the work to which he is best fitted, he is not so productive to himself, his employer, or society, and a triple loss is sustained. In a society with so many individuals of different abilities, and so many jobs requiring different kinds of abilities, there is opportunity for great loss and great gain. The individual knowing little of his own specialized aptitudes and still less of the specialized requirements of different kinds of work is often in a quandary as to what job he is best fitted for. It is no wonder that there are so many misfits in industry. This is one of the great problems of modern production—to effect a more intelligent and scientific distribution of the workers in relation to the work to be performed.

The efforts that are being made in the various fields of applied psychology in the analysis of the intellectual faculties and of the factors underlying special aptitudes and in the study of the emotions, the work of vocational guidance that is being carried out by our schools and universities, and the work that is being carried forward in industry itself in the personnel departments of plants—all of these efforts are resulting in a better distribution of labor power to work and an increase in the productive capacity of individuals and of the nation at large.

The fear has been expressed that the more rigid selection of employees that is now being practiced by many concerns will deprive the inferior and unfit of their opportunity to earn a living. If this is the case, such work would be highly undesirable. The purpose, however, is not the elimination of the inferior physically or mentally but to place those of low mentality in jobs requiring no great mental ability. This is just as important from the viewpoint of efficiency as placing men of greater ability in tasks commensurate with their superior ability. Not only do a large number of tasks require but a small degree of intelligence in their performance, but also, in some cases, a high degree of mentality is undesirable. To hire a brilliant man for a monotonous task affording no scope for his abilities would simply mean that in a short time he would throw up the job. Much of this would inordinately increase labor turnover in the plant. For this reason, some concerns that use psychological tests in selecting employees have a maximum score. Any candidate for the job who makes a higher grade than the one set is not eligible. Psychological tests have tended to show that quite a proportion of people do not possess a high degree of mentality, to put it mildly, and many of these are not willing to put forth any great effort to think, so that it is probably not far from the truth to say that there is no great dearth of people fitted by inclination if not by ability to those tasks which require but a small degree of intelligence for their efficient performance. Many prefer such tasks.

In the case of the selection or rejection of employees on account of physical abilities or disabilities, the purpose is to select the type of man physically fitted to the particular job and to reject those physically unfitted for certain jobs. This does not necessarily work a hardship on the weak and afflicted. On the contrary, the policy of an up-to-date personnel department in respect to the physical selection of men is of as much benefit to the employees as to the management. It is true, a physical examination is required, but the only kind of man likely to be barred from employment is the one with some contagious disease or one who is afflicted by some trouble which would be aggravated by the conditions in that plant. It is part of the practice in job analysis to list any particular physical disadvantage of a job,

so that a man may not be hired for that job who might be injured by it. This is not, of course, done in every plant or in the majority of plants, even, for many plants are without personnel departments. But it is quite typical of the practice of large up-to-date corporations, which have installed personnel departments, and it does not smack of charity in the slightest—it is simply good industrial practice. In large plants, the physical requirements of jobs show a wide variation, making it possible to hire men possessing different physical qualities and even those suffering from physical disabilities. The efforts made after the war to provide employment for disabled soldiers showed the possibilities in the way of providing productive employment to the partially disabled. Henry Ford's description of what has been done in the Ford plants presents an interesting picture of what one concern has done in this direction toward the classification of jobs according to the physical capacities of the workers:

We are too ready to assume without investigation that the full possession of faculties is a condition requisite to the best performance of all jobs. To discover just what was the real situation, I had all of the different jobs in the factory classified according to the kind of machine and work—whether the physical labor involved was light, medium, or heavy; whether it was a wet or a dry job, and if not dry, with what kind of fluid; whether it was clean or dirty; near an oven or furnace; the condition of the air; whether one or both hands had to be used; whether the employee stood or sat down at his work; whether it was noisy or quiet; whether it required accuracy; whether the light was artificial or natural; the number of pieces to be handled per hour; the weight of the material; and the description of the strain upon the worker.

It turned out at the time of the inquiry that there were then 7,882 different jobs in the factory. Of these, 949 were classified as heavy work requiring strong, able-bodied, physically perfect men; 3,338 required men of ordinary physical development and strength. The remaining 3,595 jobs were disclosed as requiring no physical exertion and could be performed by the slightest, weakest sort of men. In fact most of them could be satisfactorily filled by women or older children. The lightest jobs were again classified to discover how many of them required the use of full faculties, and we found that 670 could be filled by legless men, 2,637 by one-legged men, 2 by armless men, 715 by

one-armed men, and 10 by blind men. Therefore, out of 7,882 kinds of jobs, 4,034—although some of them required strength—did not require full physical capacity. That is, developed industry can provide wage work for a higher average of standard men than are ordinarily included in any normal community. If the jobs in any one industry, or, say, any one factory, were analyzed, as ours have been analyzed, the proportion might be very different, yet I am quite sure that if work is sufficiently subdivided—subdivided to the point of highest economy—there will be no dearth of places in which the physically incapacitated can do a man's job and get a man's wage.[1]

Summary.

The factors determining the productivity of the labor power of the nation may be grouped under five heads: (1) health and vigor; (2) mental energy; (3) intellectual processes; (4) character traits; (5) knowledge. The problem of labor efficiency is largely mental. Psychology has rendered valuable assistance to the economist in supplying a clear analysis of the mental processes underlying productive ability and in inventing the means of approximate measurement of these factors. In the light of this knowledge, it is manifest that there lies dormant in the individuals constituting the working population of the nation a rich mine of productive power capable of development.

References

CODY, SHERWIN, "Commercial Tests and How to Use Them."
FISHER, IRVING, and E. L. FISK, "How to Live."
HOLLINGWORTH, H. L., "Judging Human Character."
JAMES, WILLIAM, "Psychology" (briefer course); also, "On Vital Reserves."
KEMBLE, W. F., "Choosing Employees by Mental and Physical Tests."
KIRKPATRICK, E. A., "Imagination and Its Place in Education."
STARCH, D., "Experiments in Educational Psychology."
WATT, H. J., "Economy and Training of Memory."

[1] FORD, HENRY, "My Life and Work."

CHAPTER V

THE DIVISION OF LABOR: ITS ADVANTAGES AND DISADVANTAGES

The productivity of labor depends not only on the inherent efficiency of the laborer but also on the degree to which that labor is specialized. One of the distinguishing features of our modern industrial system is its minute division of labor. Indeed, in no other particular is it more strikingly differentiated from previous systems of industry than by the extreme degree to which it has carried specialization. Under the handicraft system of medieval times, the village shoemaker completed a pair of shoes. Today, in a Brockton shoe factory, the making of shoes is often divided into 130 distinct operations, each performed by a separate class of workmen. The radical change which has taken place in the making of shoes is typical of the manufacture of other products. The old-fashioned watchmaker has been replaced in one of our high-grade watch factories by a thousand men, each engaged on one operation of the many necessary to complete the watch. The place of the old-time shoemaker, watchmaker, or tailor is taken by a host of different workmen, each performing but a single operation on the product.

In the professions, specialization is equally marked. The early "engineer" has been suceeded by the mechanical, civil, electric, hydraulic, gas, chemical, or other engineering specialist, just as the old-fashioned medical practitioner has given way to the eye, ear, nose, heart, or other medical specialist. Throughout our whole economic system, specialization is the order of the day.

In the Evolution of Industry, No Tendency Is More Marked and Persistent than Labor Specialization.

The history of industry is largely a record of the division of tasks. From what was probably the earliest separation of tasks —that between man and woman—down through the medieval

trades and handicrafts, to the present numerous and varied branches of industry, each with its own subdivision of employments, this tendency toward division of tasks has been continuously operative. The U. S. Census report on occupations, 1910, in reference to the difficulty of classifying employments, states:

> Formerly under the guild system, to a large degree, each workman had a definite occupation or trade as cooper, tailor, shoemaker, etc., but with the transition to the factory system, and the great division of labor which accompanies it, the tendency has been for each of these old handicraft trades to give place to a number of specific processes in the manufacture of the same article. The transition is still in progress, so that today a workman may make the whole of an article or perform several of the processes in its manufacture or perform only one of them.

The latest manifestation of this tendency is seen in "scientific management," which carries out in a systematic manner the principle of division of labor. The task of the workman after accurate observation by an expert is split up into simple movements; unnecessary motions are eliminated, and the remainder arranged into convenient groups, each group constituting a separate task. The workmen are then taught to perform this task in the manner which the experts have determined by scientific study to be the most efficient. Scientific management introduces a new, or, at least, a greater, degree of specialization into the work of the management itself, a specialization based on functions, on account of which Frederick W. Taylor termed his new system of management "functional management," which he defines as:

> . . . so dividing the work of management that each man from the assistant superintendent down shall have as few functions to perform as possible. If practicable the work of each man in the management should be confined to the performance of a single leading function.

In carrying out this principle, he first divides the work of shop management into two main divisions—planning and executing. The work of planning is concentrated in a planning department consisting of four men, the "order-of-work clerk," "instruction-card man," "time-and-cost clerk," and "disciplinarian." The work of execution is performed by four others

—the "gang boss," "speed boss," "inspector," and "repair boss," who see that the work is carried out by the workmen exactly as it has been planned. The gang boss shows the men how to set up the work in their machines and sees that there is a new job ready for a man as he finishes his old one. The speed boss sees that the proper cutting tools, with the speeds, feeds, and depths of the cut which the instruction card directs, are used. The inspector is responsible for the quality of the work. The repair boss sees that the machines are kept oiled, cleaned, and in first-rate working condition. Each of these men is ready not only to advise but also to pitch in and show how the work should be done. Under this system, the old-fashioned foreman has been replaced by eight specialists, called "functional foremen," each of whom performs but one of the eight duties previously the work of one man.

Division of Labor Based on a Universal Law of Organic Development.

"Division of labor" may be defined as the dividing of what was previously one economic task into several parts, each constituting a new task to be performed by a separate individual. This principle we have seen to be in operation ever since "Adam delved and Eve span." It is by no means limited to economic activities but is a universal principle, operating in every sphere of life. In evolution it is termed "differentiation," or "division of functions," and is a process observed in the development of all forms of organic life. In the progress of organisms from simple to complex forms, from the lower to the higher, with the development of special organs comes a corresponding increase of functions or division of tasks. As a new organ develops, it takes over a special task, to supply either a new need of the organism or one previously undertaken by other organs. In the simplest form of organism consisting of a single cell, the one cell performs all of the simple functions of life—seeing, eating, digesting, locomotion, and reproduction. Higher up in the scale of life we find animals endowed with separate organs for the performance of these special functions, an eye to see with, a stomach for digesting food, feet for locomotion. The higher in the scale of life the organism the greater the degree of specialization.

The same law is observed in the progress of economic societies and in the organizations within them; there is a development from simple to complex forms accompanied by an increasing division of labor. A high degree of division of labor would be impossible in a primitive state of industrial society. The extent to which this principle has been carried today in the United States has been made possible by the development of its systems of transportation and internal communication, its complex systems of money and credits, and its industrial organizations. This law of division, which lies in the nature of all organic development and which man has followed more or less blindly for ages in the performance of his work, has now been recognized by modern scientific management, which adopts as a fundamental principle that all tasks be so divided that each worker is confined to that simple operation which he can perform the most efficiently.

Simple and Complex Division of Labor.

The fact that division of labor has proceeded from simple to complex forms has led some economists to classify division of labor under the two heads, simple and complex. The classification is, of course, an arbitrary one. The degree of division has been continuously increased and is being increased today, so that the extent prevailing at any one time would appear complex compared to that of the previous period. This twofold classification roughly corresponds, however, to two general stages in the history of division of labor. By simple division is meant the splitting up of the work of production into crafts or trades, a form of division which dates back to antiquity but which reached its climax in the guild system of medieval times—the golden age of the craftsman—it still persists; the doctor, dentist, carpenter, and custom tailor are modern examples. By complex division is meant the separation of the trade or craft into several processes, which, in turn, are subdivided into spinning, weaving, dyeing, fulling, and finishing, and these, again, are still further subdivided. A rather freely quoted but exceedingly apt illustration of the effect of complex division of labor on the craft of the old-fashioned butcher is given by Professor

Commons in his description of labor conditions in the meat-packing industry:

> Notwithstanding the high skill required, the proportion of skilled workmen in the butchers' gang is very small, owing to a minute division of labor. It would be difficult to find another industry where division of labor has been so ingeniously and microscopically worked out. The animal has been surveyed and laid off like a map; and the men have been classified in over thirty specialties and twenty rates of pay, from 16 to 50 cents an hour. The 50-cent man is restricted to using the knife on the most delicate parts of the hide (floorman) or to using the axe in splitting the backbone (splitter); and, wherever a less skilled man can be slipped in at 18½ cents, 20 cents, 21 cents, 22½ cents, 24 cents, 25 cents, and so on, a place is made for him, and an occupation mapped out. In working on the hide alone there are nine positions, at eight different rates of pay. A 20-cent man pulls off the tail, a 22½-cent man pounds off another part where the hide separates readily, and the knife of the 40-cent man cuts a different texture and has a different "feel" from that of the 50-cent man. Skill has become specialized to fit the anatomy.

General Increase in Productivity Due to Division of Labor.

Though the individual appreciates the value of specialization in reference to his own work, he fails, as a rule, to realize the tremendous increased productivity in the nation as a whole that results from the ever widening application of this great principle to the arts of industry. It is hard for a twentieth-century man even to conceive of an industrial society devoid of division of labor. To do so would be to go back to primitive times when each individual shifted for himself. So far has this principle raised us above our ancestors that the mere idea of a civilized man's making his own shoes, clothes, furniture, and food from start to finish is as ludicrous as the accomplishment would be impracticable. So accustomed have we become to the advantages of our present system that we seldom stop to think of the variety and number of specialized workers who contribute to the making of even the most common articles of daily use. An article as simple as the collar we wear involves the storekeeper and his staff, from whom we purchase it, the manufacturer with his salesmen, the members of his organization, his skilled and semiskilled labor force (a collar passes through 150

different hands in its making in the factory), the textile workers who made the cloth, the planters who raised the cotton, the makers of the tools, machines, and buildings for all these, the railroad companies and employees who transported all these commodities, and so on, back through an endless maze, each worker as superior to us in his particular line as we are to him in ours. To the cumulative increase in production arising from this division of labor is largely due the the luxury and wealth of civilized life.

How Division of Labor Increases Production.

Division of labor increases production, first, by adding to the skill and dexterity of the workman. It is obvious that a man will attain more skill by confining himself to one trade than by becoming a jack-of-all-trades. Practice makes perfect, and the law of habit enables the task to be carried out almost automatically, with a minimum of fatigue. Speed, ease, and accuracy result.

Second, it increases production by shortening the period of preliminary training necessary for the learning of a trade. The more minute the division of labor the shorter the task, the easier it is to master it. In the skilled trades, the 7 years' apprenticeship has shrunk to 3 years, and with the rapid increase of semiskilled jobs and the minute division of labor due to efficiency engineers, the requisite training for many jobs can be acquired in from 2 days to 3 months. This is illustrated by the length of time required to become proficient in the various occupations in the Ford plants as given by Henry Ford:

> . . . 43 per cent of all the jobs require not over one day of training; 36 per cent require from one day to one week; 6 per cent require from one to two weeks; 14 per cent require great skill as in tool making and die sinking.

Third, division of labor increases production by permitting the most economical utilization of labor. In the meat-packing industry just referred to, of a gang of 230 men killing 105 cattle an hour, 11 were paid 50 cents an hour, 3 received 45 cents, while 86 were paid 20 cents and over, and 144 got under 20 cents. Instead of the whole job's being done by all-around

butchers, it is so divided that the small part of the work demanding a high degree of skill is delegated to 11 picked men; that requiring only mediocre skill is given to the 86 men of medium grade, while the greater bulk of the work which requires no special ability is dispatched by the lowest grade of labor. The great shortage of skilled labor in British industries during the war has given rise to the practice described as the "dilution of skilled labor." The work previously done by the skilled mechanic or other tradesman has been so subdivided that the operations requiring a lesser degree of skill are performed by women, after a brief preliminary training, leaving to the mechanic only the finishing touches or those operations demanding the highest degree of skill.

Under scientific management, the tasks are divided according to the grades of ability required to perform them, and the men are carefully selected with a view to their fitness for each task. The planning and routing of work is taken out of the hands of the workmen and given to men selected by the management for their superior education and ability, who perform this work very much more efficiently than the workmen. The skilled mechanic is relieved of the unskilled work connected with his task and, therefore, turns out a larger product, while the specialized laborers dispatch their simplified tasks with the accuracy and speed born of constant repetition. Thus, tasks are scientifically divided according to brain, brawn, or skill, and the ability of each worker is applied in the most productive manner.

Fourth, by providing a wider range of choice in occupations, division of labor increases production by making it possible for individuals to find occupations for which they are particularly fitted. There is such a variety of diversified tasks in industry today that almost anyone can find some one job suited to his particular ability or inability. The valuable work carried out in the last 10 or 12 years in the field of applied psychology has demonstrated the fact that human intelligence and human abilities are more diversified than it was previously thought. The study of special aptitudes and specialized abilities as well as the analysis of general intelligence which has been made by psychologists in cooperation with business men, and the development of job analysis, has demonstrated beyond a doubt the loss sus-

tained when workers are not properly placed in jobs according to their specialized abilities.

Fifth, by confining himself to one task, the specialist saves the time which would otherwise be lost in passing from one job to another. A workman doing two or three kinds of work often wastes time either in changing tools or in shifting his position from one place to another.

Sixth, by simplifying the task, division of labor facilitates the substitution of machinery for handwork. Once a task is reduced to the mechanical repetition of a few simple operations, the next step is the invention of a machine which will perform the task with greater speed and accuracy than the human hand. The simple division of labor existing in the beginning of the eighteenth century in England paved the way for the mechanical inventions that ushered in the Industrial Revolution. The textile industry, which early showed a division into processes, as spinning, weaving, fullering, and dyeing, took the lead in the adoption of machinery. Spinning, which involved the mechanical twisting of the cotton fiber, was first taken over by a machine. Hargreaves, in 1764, invented the spinning jenny, which was followed, in 1769, by the water frame of Richard Arkwright. In 1779, Crompton patented his spinning mule, which combined the good points of the previous two inventions and produced a finer and stronger thread at a faster rate. Attention was next turned to the more complicated process of weaving, with the result that, in 1782, Edmund Cartwright invented the power loom. Watts' improvement of the steam engine made possible the use of steam as a motive power, and by the beginning of the nineteenth century machinery had supplanted handwork in the textile industry.

No sooner had division of labor admitted machinery into the industrial system than the latter began to repay the good turn by advancing specialization. These two aid and abet each other; division leads to the use of machinery, and machinery induces further division of labor. The specialized machine calls for a specialized worker. In our factories and offices has sprung up a host of semiskilled craftsmen and specialized laborers whose function in life it is to operate the machine. The tendency is, however, for the machine to become more and more self-sufficient,

to require less and less skilled supervision by the operator, who, in many cases, is required only to start and stop it. The question arises as to whether or not the development of automatic machinery will not eventually reduce machine operation to the level of common labor, demanding only specialized skill for setting up the machines. A second way in which machinery has increased division of labor is through the creation of those industries engaged in the making of machinery, and their dependent trades and professions, such as the various branches of mining and engineering. These give rise to a widespread division of labor, resulting in an endless variety of specialized occupations.

Under scientific management, the substitution of machinery for man power has been carried to an extent hitherto impossible. Motion-study work, one of the foundation stones of scientific management, has as its object the reduction of jobs to a few simple and mechanical operations. The next step, the invention of a machine to accomplish the task, is thus greatly facilitated. In those shops where scientific management has been adopted or where motion-study work only has been carried out, the substitution of machinery for human labor has been remarkably accelerated. The more efficiency engineers bend their energies toward reducing human tasks to fewer and simpler operations the easier it becomes to replace the man by a machine which performs the work with greater speed, accuracy, and ease than any man could possibly do it. Scientific management thus greatly promotes the use of machinery through its minute subdivision of labor and is destined, as it becomes more universally adopted, to extend the application of machinery to human tasks to a degree today scarcely realized.

THREE DISADVANTAGES CLAIMED FOR DIVISION OF LABOR

The first disadvantage claimed for division of labor is that the narrow range of activities of highly specialized work leaves no play for the use of the higher faculties, while the monotony born of constant repetition exerts a deadening effect on the worker. It is a question whether or not division of labor is to blame for the monotony and lack of the educational element

in many kinds of specialized work. A large class of skilled and semiskilled technical work and ordinary labor, which has been specialized, never was of a particularly elevating or broadening character. This much may be said for division of labor, that it tends to counteract the narrowing effect of work by allowing many hard and monotonous hand tasks to be given over to machinery and, also, tends, as a result of increased productivity, to decrease the hours of labor. It is further claimed that the specialized worker is forced to take a greater risk, in that he must depend on one small job, to earn his living. This danger is lessened by the fact that specialization in shortening the preparatory period of training enables the worker to master a new trade with greater ease or to learn two trades, holding one as a reserve in case the other fails. In many shops where scientific management has been introduced, the men are encouraged to learn two jobs. It has been further charged against specialization that, owing to the narrowness of their training, the workers are unable to adapt themselves to new conditions and methods and that, thus, industrial progress is hindered. This is true provided workmen depend on their jobs for their education and training. It would be manifestly unjust, as well as disastrous, if the worker did not receive, in shorter hours and increased pay, part of the benefits derived from the superiority of his specialized labor. There is a tendency to reduce working hours, also to increase by law the period of education which the boy must have before he is allowed to work. By extending the schooling of the youth previous to his becoming a worker, and allowing him more leisure to continue his education after he becomes a worker, the harmful effects of specialization will be offset.

Division of Labor Dependent on the Extension of the Market. It is evident that there could be no division of labor without exchange. One man could not spend his entire time making one product, unless there were others with whom he could exchange that product for the things he needed. And in order for him to exchange his whole output, there must needs be a sufficient number of accessible consumers. In other words, division of labor is limited by the extent of the market for the

product. The small town of the Middle Ages afforded a sufficiently large market for the shoemaker, but it could not have absorbed the output of a modern shoe factory turning out 1,000 pairs of shoes a day. Through the invention of the locomotive by Stephenson and of the steamboat by Fulton in the beginning of the nineteenth century, with the remarkable development of transportation which has resulted, the village market has been extended to include the nation and, for many products, the world at large. This extension of the market by transportation has made possible the production of commodities on a scale large enough to enable manufacturers to avail themselves of the advantages due to specialization.

LOCALIZATION OF INDUSTRY

There is a geographical division of labor resulting in the concentration of certain industries in particular localities. Owing to the development of transportation which has allowed goods to be profitably marketed at an ever increasing distance from the plant where they were manufactured, the localization of industries, during the last hundred years, has proceeded at a rapid rate. Thus, Pittsburgh specializes in the production of steel; Akron, of rubber; Troy, of collars and shirts; Detroit, of automobiles. Districts and nations follow the same principle on a wider scale; California supplies citrus fruits; the Middle West, grain; the South, cotton; eastern Pennsylvania, anthracite coal; while New England makes textiles, shoes, and other manufactured goods. Great Britain devotes herself to manufacturing and exchanging her products for raw materials and goods such as mutton and wool from Australia and New Zealand, wheat from Canada and the United States, cotton from India and the South. Just as individuals confine themselves to one occupation, so localities specialize in the production of certain commodities.

The following are the chief factors determining the localization of industries: Cheap and plentiful power exerts a magnetic influence in attracting industries to particular districts. Pittsburgh owes its superiority as a steel center to its proximity to

the finest beds of coking coal in the world as well as to its supply of that purest of fuels—natural gas. A second factor is the availability of raw materials. This operates most extensively in the extractive industries. Memphis owes its importance as a lumber center to its nearness to the forests of the south. The city of Lancaster, situated in the midst of the rich tobacco-growing county of Lancaster, Pa., spends most of its time in making tobacco and cigars. Proximity to markets is another factor not so important as it was before the development of transportation but still important. New England is a manufacturing center today primarily because those states were populated when industries were being established. Since 1850, the center of manufacturing has followed the center of population westward. The importance of proximity to markets and raw materials depends on the cost of transportation. Climate, of course, largely determines agricultural specialization and also affects manufactures. Cotton spinning requires a moist climate; tobacco, a dry atmosphere. A plentiful labor supply is a vital factor. Manufacturing industries tend to locate in those districts where there is a good supply of labor. Often, an industry owes its start in a locality to accident. Lynn, Mass., owes its prominence in the shoe industry to the fact that, in 1850, John Adams Dagyr, a skilled Welsh shoemaker, settled there and became famous all over the country as a maker of fine shoes. Had he taken up his residence in North Adams, Mass., that city might have been a center for the shoe industry.

Once an industry secures a flying start in a community, certain inherent advantages arise which tend to perpetuate it. It acquires a specialized labor force, a fact alone which offers a powerful incentive to new plants seeking a location.

The big reason why the shirt and collar business grew to such proportions in Troy was its labor advantages. For a great many years after the industry was established in Troy only hand labor and practically no machinery was used in the manufacture of collars and shirts. Considerable skill was required to do the work at all and much more to do it efficiently and expeditiously.

The people who took up this employment were the natives of the district, an exceptional class of people, usually having had good home

surroundings and educational advantages. No foreign labor was then and little is even now found in the factories.

Such people naturally furnished very high-class service to their employers. Their children grew into the work, and succeeding generations in turn fell heir to these occupations. In this manner and by natural growth there grew up and was established a highly skilled class of employees in the Troy collar factories.

As the business expanded, it was thought, for very good reasons, that the establishment of factories in other parts of the state would be advisable. But practically all attempts to start factories elsewhere were complete failures on account of the lack of trained labor. It was found that this labor could not be trained in any reasonable period of time.

In recent years the situation has changed somewhat on account of the fact that a great deal of machinery has been introduced. Troy still has a great advantage as a collar manufacturing center, however, for training in the use of the machinery in this industry is local to this section.[1]

Other advantages arise from the conveniences which accrue to dependent and interdependent industries being situated together. Those allied trades manufacturing the machinery, supplies, and accessories find a ready market for their products, while those using the by-products of the bigger industries are handy to their raw material. Thus, specialization facilitates cooperation the advantages of which induce still further specialization.

By the operation of this principle, each locality tends to produce those commodities to which it is best adapted by situation, skill, climate, or resources. If this ideal could be universally and completely realized, and each district and each nation produce only those commodities which it could produce more economically than others and exchange those commodities for the products more economically produced by other localities, all goods everywhere would be produced at lowest cost. Like every other principle, there are limits to its operation. There are political reasons for the limitation of this principle in international trade, while the extension of the market, which, as we have seen, is necessary for the development of specialization, also acts as a limit to this phase of it.

[1] Bureau of the Census Bulletin on Shirt and Collar Industries.

Geographical Concentration of Industry Limited by Cost of Marketing.

The concentration of an industry in one locality takes place because of the economies of specialization and mass production. It is evident, however, that as an industry becomes centered in one place while the area over which its product is distributed widens, the cost of marketing its product will tend to increase.

The tendency toward local concentration of industries which has been evident in the United States in the past has tremendously magnified the area over which commodities must be distributed to an ever increasing number of consumers. This has given rise to the development of a highly complex marketing system and greatly increased the cost of the functions which that system must perform, the cost not only of transportation but also of storage, financing, and selling.

The inevitable result of such a situation is that the economies of specialization and mass production will be partially offset by the increased cost of marketing the product. And if the cost of marketing increases to a point beyond the reduction of cost due to the economies of specialization and mass production in manufacturing, there will be a tendency for industry to decentralize and readjust itself to the determining factors in its market.

There is reason to believe that in certain industries in the United States this point is rapidly approaching, or has already been reached, and that a tendency toward decentralization is already manifesting itself. The migration of industries such as the steel industry, the boot and shoe industry, the textile industries, the machine-tool, and other industries no doubt indicates the existence of this tendency in some of our older industries.

Summary.

"Division of labor" may be defined as the splitting up of what was previously one economic task into several parts, each constituting a new task to be performed by a separate individual. This principle of division is one of the fundamental laws of evolution and marks the progress of all living things from lower to higher forms. The same law characterizes the advancement

of economic societies and institutions. The recognition of this law by industrial engineers has resulted in a scientific subdivision of the routine tasks of industry and, also, in a high degree of specialization in the work of management. Division of labor is one of the most marked characteristics of our present economic system.

Division of labor may be classified as simple and complex. Simple division of labor is illustrated by the division of work into trades or crafts. Complex division occurs when the work of a trade or craft is subdivided into smaller parts. It is this latter process which has been carried out to such a minute degree under mass production.

The application of this principle has tremendously increased the productivity of labor in modern industry. This increase of productivity has been brought about in the following ways: (1) by adding to the skill and dexterity of the workers; (2) by shortening the period of preliminary training for jobs; (3) by permitting a more economical utilization of labor; (4) by diversifying tasks, thus enabling individuals to find jobs suited to their particular abilities; (5) by the saving of time previously lost in passing from one kind of work to another; (6) by simplifying tasks and thus facilitating the substitution of machinery for labor.

Division of labor has been adversely criticised on the following grounds: (1) that it narrows the mentality of the workers; (2) that it increases the risk of the worker in that he is dependent on one job; (3) that the narrowness of specialization prevents the workers from adjusting themselves to changing conditions.

Division of labor is dependent on the extension of markets. The development of transportation, with the consequent expansion of markets and the growth of large-scale production, has made possible the high degree of division of labor seen in industry today. The same forces have furthered the geographical specialization of industry, whereby each locality has been able to devote itself to the production of those commodities to which it is best adapted by situation, skill, climate, or resources. The tendency toward local concentration of industries, which has been evident in the United States in the past, has increased the

area over which commodities must be distributed to consumers. If the increased cost of marketing should exceed the reduction of cost due to centralized manufacturing, there will be a tendency for industries to decentralize.

Test Questions

1. How is the principle of division of labor carried out in F. W. Taylor's system of Scientific Management?
2. Give a definition of "division of labor."
3. What part does this principle play in the evolution of all living organisms and economic organizations?
4. Distinguish between simple and complex division of labor.
5. Show how division of labor is carried out in the making of any ordinary article, such as a collar.
6. Explain five of the chief advantages of this principle.
7. What is the relation between machinery and division of labor?
8. Name three disadvantages of division of labor.
9. What connection is there among division of labor, transportation, the extension of the market, and large-scale production?
10. Name the factors governing the location of industries.
11. Why is Pittsburgh a steel center? Troy, the center of the collar industry? Lynn, a shoe-manufacturing city?
12. What advantages arise from geographical division of labor?

References

BABBAGE, T., "Economy of Machinery and Manufacture," Chaps. XIX–XXIII.
CARVER, T. N., "Principles of Political Economy," Chap. X.
CLAY, H., "Economics for the General Reader," Chap. II.
MARSHALL, A., "Principles of Economics," Book 14, Chap. IX.
NICHOLSON, J. S., "Principles of Political Economy," Book I, Chap. VII.
PALGRAVE, "Dictionary of Political Economy," Vol. I, p. 608.
SAY, J. B., "Political Economy," Book I, Chap. VIII.
SCHMOLLER, "Jahrbuch für Gesetzgebung."
SELIGMAN, E. R. A., "Principles of Economics," Chap. XIX.
SMITH, A., "Wealth of Nations," Book I, Chap. I.
TAUSSIG, F. W., "Principles of Economics," Chap. III.
TAYLOR, F. W., "Shop Management."

CHAPTER VI

CAPITAL AS A FACTOR IN PRODUCTION

Capital a Derived Factor.

We have thus far discussed only the two primary factors of production—nature and man—the former contributing the raw materials and forces out of which and by whose aid all wealth is produced; the latter, the manual and mental effort required in the process. To the action of these two elemental agents the production of all wealth can finally be traced. There figures, however, in the roundabout system of modern production, a third factor, termed "capital," a product of nature and labor, which, however, assumes in the intervening period occupied by the changing of the raw material into the finished product the character of a separate factor. Though all capital can be analyzed into its two constituent elements—nature and labor—it is convenient for practical purposes to distinguish it as a separate agent, just as in practical affairs we deal with water in preference to its two constituent elements hydrogen and oxygen.

The derived nature of capital might be illustrated in the simple case of a woodman felling a tree. The woodman represents labor; the tree, nature; the axe, capital. The woodman as a man, the tree as a product of nature are elemental factors in the process; each is finally responsible for the part it plays in the production of timber. But what about the axe? Does responsibility terminate in that, also, as an elemental factor? Evidently not, for whether the axe serves its purpose well or ill depends on the material of which it is composed and the skill exercised in its construction. In other words, nature and labor are responsible for the productivity of the axe. From the mining of the ore, in the various stages through which it has passed in its transformation into the keen-edged head of an axe, labor and natural forces acting together have fashioned it, with the aid

of tools previously made in the same manner. It cannot be counted a primary factor in production any more than a rifle in the hands of a man who had shot another could be counted as a primary factor in the killing, though both axe and rifle would be important secondary factors. It is in this sense that capital figures as a factor in production.

Importance of Clear Conception of Capital.

The increasing dependence of industry on capital and capitalistic methods of production, coupled with the tendency for its control and ownership to concentrate into the hands of large corporations governed by a few individuals, has given rise to problems which powerfully affect the welfare of the whole nation. For the peaceful and just solution of these, a clear conception of the nature of capital, the services it performs, and its relation to labor is absolutely necessary. Conflicting interests, as well as the complex nature and operation of capital itself, tend to confuse ideas and have given rise to different opinions as to what is and what is not capital.

Different Definitions of Capital.

An introductory text on economics should not confuse the mind by a consideration of dissimilar definitions; but, on the other hand, the student should not be kept in ignorance of the fact that in the field of economic theory men cross swords to decide the truth. Capital, as defined by Adam Smith is, "that part of a man's stock which he expects to yield him a revenue." He would exclude a dwelling house occupied by the owner. Hermann, who makes the distinction between capital and non-capital that between durable and perishable goods, would include a house as a capital good, but would exclude, on account of its perishability, fruit in a fruiterer's store, which Adam Smith again would call capital. Some economists include all wealth as capital; others, as Clay, confine capital to that part of wealth used for production; while still others, as Kleinewachter, would further limit it to the tools of production alone. Again, some authors strictly limit capital to material goods; others, as McLeod, extend it to include immaterial goods which produce profit, including labor, credit, art, education, and even

an author's mind. Karl Marx confines capital to those productive instruments which are to be found in the hands of persons other than the laborers and are used to exploit the laborers. With him capital is a "means of exploitation." Jevons, on the contrary, conceives capital as "the aggregate of those commodities which are required for sustaining laborers of any kind engaged in work." Böhm-Bawerk stoutly maintains that

> . . . it is not the means of subsistence, and in particular it is not the means of subsistence alone, that constitutes capital. Capital only comes into existence when man enters upon that profitable roundabout journey that the means of subsistence have made possible; when he builds machines, tools, factories, raises raw materials, and so on.

All of which recalls an incident in the life of the late William James. While on a hunting trip he returned to camp to find his companions engaged in a ferocious dispute; feelings ran high and friendship was strained to the breaking point. James was asked to decide the question, which was this: Suppose a squirrel to be on the trunk of a tree and that a man were to encircle that tree; does the man go around the squirrel or not? (He goes around the tree sure enough and the squirrel is on the tree, but does he go around the squirrel?) One side maintained that he did not, for as he circled the tree, so did the squirrel, always keeping the tree between himself and the man. The other side was just as emphatic in stating that he did, because if he went around the tree and the squirrel was on the tree, he must go around the squirrel. James decided the issue by affirming that which party was right or wrong depended entirely on what was practically meant by "going around the squirrel."

> If you mean, said James, passing from the north of him to the east, then to the south, then to the west and then to the north of him again, obviously the man does go around him. But if on the contrary you mean being first in front of him, then on the right of him, then on his left, and finally in front again, it is quite as obvious that the man fails to go around him, for by the compensating movements the squirrel makes, he keeps his belly turned toward the man all the time. Make the distinction and there is no occasion for any dispute. You are both right, and both wrong, according as you conceive the verb, "to go around" in one practical fashion or another.

What Is Practically Meant by Capital.

So with regard to the conception of capital. The difference of definition is due primarily to the fact that economists differ in what they "practically mean" by capital. As Böhm-Bawerk puts it:

> The material difference in the definitions is not so much that the one thing to be defined appears to each in a different light, as that each one is defining an entirely different thing.

After all, it does not so much matter what capital means as what we mean by capital. And by capital as a factor in production we mean all *economic goods,* land excepted, used as aids to further production; all wealth used for this purpose is capital.

Category of Capital Goods.

This definition automatically divides wealth into two parts: first, consumption goods, comprising all commodities possessed by consumers, for the satisfaction of wants; second, capital goods, consisting of all commodities in the hands of producers, used for productive purposes, such as:

1. Permanent improvements in land, as drainage systems, harbors, dams, and fences.
2. Buildings used in production, as factories, barns, power houses, also rented dwellings.
3. Tools and machinery.
4. Rolling stock of railroads, trucks, and wagons.
5. Horses and other beasts of burden.
6. The raw and auxiliary materials of production.
7. Stocks of goods on dealers' shelves.
8. Money.

It has been said that the difference between capital and consumption goods is but a difference of degree, in the sense that both are means to the satisfaction of wants, both yield utilities —the difference being that the former usually yield their utilities indirectly and slowly, but the latter directly and more immediately. This difference, however, is fundamental and fully justifies the distinction. Capital goods are in the hands of pro-

ducers for the purpose of further production; consumption goods are in the possession of consumers for the purpose of consumption. The former are circulating in the course of exchange; the latter are withdrawn from the market in the hands of private individuals: the former add to the productivity of labor, the latter do not. The distinction then is not only fundamental but also practical, for it marks off for separate study a complex but concrete group of intermediate products whose common function is to act as an aid to labor in production, an aid without which industrial society could not for one moment produce those multitudinous things that go to make modern life worthwhile.

Fixed and Circulating Capital.

Capital is sometimes spoken of as either fixed or circulating. These are terms of common usage, and like most popular distinctions they are based on a practical difference in the nature of the two kinds of capital goods which they distinguish. In modern industry, capital goes through a series of cycles. It usually starts in the hands of the entrepreneur in the form of money or credit, with which he enters the market and purchases plant, machinery, raw materials, etc. These are transformed in the processes of production into the finished product which is sold on the market for money. This cycle from money into money consists of three stages: (1) that in which the money capital is exchanged into elementary capital goods; (2) wherein these goods are transformed into the finished product; (3) whereby the produced commodities are exchanged into more money. With this money the entrepreneur again buys more elementary capital goods and the cycle is repeated. This periodical rotation of capital is called its "turnover." From the point of view of the business man, the turnover is the length of time his money capital takes to reproduce itself in the price of the product, plus, of course, an added value in the shape of a profit. While the length of this time varies in different branches of industry, the year is usually taken as the unit time of the rotation or turnover of capital.

Now, it is the relation which capital goods bear to this unit period of production that has led to the distinction between fixed

and circulating capital. Most of the raw and auxiliary materials used in production pass into the product of the current period, and their total value is reproduced in the price of that product. These forms of capital are termed "circulating capital goods." It might be well to introduce here auxiliary capital goods. Some of the materials of production enter directly into the product, with, of course, a change of form, as iron ore into steel, and sand into glass. Others, however, such as the gas used for fuel in a blast furnace or oil used for machinery, do not pass bodily into the product, though they do add value to the product; these are termed "auxiliary capital goods." Most auxiliary capital is circulating capital and is merged in the current product with the raw materials. An exception to this would be fertilizer applied to land the benefits from which might be spread over two or three years' crops. In this case, part of the value of the fertilizer would be transferred to the current crop, part would remain in the ground.

Distinct from the above means of production which are consumed within the current period are the bulk of the instruments of production, plant, machinery, etc., which last for years and yield a part of their capital value to the product of the current period. These do not circulate bodily into the product in the same manner as the raw materials but retain their original form, separate from the product which they helped to create. Their value, however, they do yield to the product, but by degrees. If the life of a machine is ten years, it is apparent that its total value is distributed to the product which it has helped to create in that ten years. At the end of the first year, one-tenth of the capital value of the machine will usually have passed into the product of that year, but nine-tenths remains "fixed" in the machine the predominant capital characteristic of which is fixity; hence, its name, "fixed capital." It does circulate but with the slowness of the tortoise, not the speed of the hare. As Karl Marx aptly puts it:

> In the performance of its function, that part of the value of an instrument of labor which exists in its natural form constantly decreases, while that which is transformed into money constantly increases, until at last the instrument is exhausted and its entire value detached from its body, has assumed the form of money.

In business, this transformation is brought about through a depreciation account. Supposing the life of a $1,000 machine to be ten years, with a scrap value of $100, $90 would be deducted from the money price received for each year's product and placed in the depreciation account; this fund with the $100 received for the scrap in ten years would contain the amount of money originally invested in the machine.

Surplus Labor and Saving Necessary for the Production of Capital.

It is conceivable that in the life of primitive man there was a stage when all his labor was demanded to provide food, clothing, and shelter for immediate needs. So long as all his working hours had to be spent hunting food to keep body and soul together, he could accumulate no capital. In order to provide tools to satisfy future wants more effectively, he must first spare some part of his labor from the satisfaction of present needs. He might set aside one hour each day for the making of tools or weapons, in which case these capital goods would arise directly from the labor power saved from the satisfaction of present needs. Or our primitive man might lay by a portion of food gathered each day until he had a sufficient store to last him while he devoted his whole time for two or three days to the construction of his implements. In this case, the food saved would be used to allow of future labor power being applied to the making of the tools. Here the first form of capital would be in the shape of a store of food, withdrawn from consumption, to be used for the purpose of further production; the implements produced would be the second form of capital, which the first form aided in making by setting free the labor power necessary for their production.

All capital springs from surplus labor, that is, labor over and above that which is necessary for the satisfaction of present needs. The original and essential conception of capital is that of wealth to be used as the source of future income or want gratification. This necessitates a surplus over present wants. This is true not only of ancient times but also of today and is the reason why the great majority find it hard to accumulate capital. Their labor or the product of their labor is sufficient

only to satisfy present pressing wants; they have no surplus to apply to the satisfaction of future wants. Of course, the remedy possible to most of us today is either to work harder or reduce our wants, which, however, involves sacrifice, and this brings us to the second prerequisite of capital—namely, saving. The surplus wealth that might be saved is not always saved; on the contrary, it is often spent to gratify further present wants, and no capital is accumulated. This is true of business concerns as well as individuals: If the earnings of a corporation are all paid out in dividends, instead of part being put back in the business in form of improvements or reserves, no new capital is accumulated. This little incursion into the origin of capital shows clearly that capital springs out of surplus labor the product of which is saved for the satisfaction of future wants and that it comes into existence only as a result of both labor and saving.

This surplus labor may be turned directly into some instrument of production or into a store of goods, to be used for the liberation of future labor power, for production purposes. In a modern industrial society, this store is not saved in the form of actual commodities but in the shape of money which is used for the same purpose as the store of primitive man—for the liberation of labor power for production purposes.

Take the case of a farmer. By saving part of his wheat crop he provides himself with capital in the form of seed for the following year. But in order to add to his equipment of other kinds of capital goods, as ploughs or barns, something more must be done than to save wheat. The farmer could build the barn himself in time saved from wheat growing; or he could sell part of his wheat and with the money hire a carpenter to erect the barn. In the latter case, surplus labor produces surplus wheat, which is exchanged for money, which, in turn, is saved and used to employ labor to erect a barn. Or the farmer might borrow the money from a neighbor or a bank with which to erect his barn. In this case, he borrows the capital store of another and uses it to produce a barn for himself. Here one person does the saving and the other utilizes that saving in setting labor to work for the production of capital goods. In modern society, the saving tends largely to be done by one set of persons and the production power applied by another set.

Saving in Modern Society.

It should be noticed that, in the illustration above, what was finally saved was not money but a capital good, a barn. The money saved in the first place enabled the barn to be built and a real addition to be made to the permanent wealth of the nation. In our economic system, the new wealth produced is not distributed directly to those who have helped produce it but in the form of money, which represents a claim on the real goods produced. If the money is spent for consumable commodities, then that much of the real wealth is used up or consumed; if, on the other hand, it is saved and then used to buy raw materials and employ labor for the purpose of further production, then the real wealth of the nation is increased. This conversion of money into capital goods is called "investment." David Friday estimates that in 1924 we saved about $11,000,000,000, or one-sixth of our annual income. This included about $1,000,000,000 interest and principal on investments abroad; the bulk of it represented a permanent addition to our durable wealth in the form of buildings, automobiles, and roads, permanent improvements to railroads, public utilities, machinery, and manufactures. New capital issues, excluding refunding, totaled $5,569,689,190. Part of the new capital is taken directly out of earnings by business concerns themselves, but in modern societies there has grown up an elaborate mechanism of investment the purpose of which is to facilitate the transfer of the money saved into the hands of those who are desirous of using it for the purposes of further production. Savings banks throughout the country gather up the small savings of millions of the common people. These individual amounts are usually of little account, and their owners are not in a position to utilize them in further production. But pooled in these institutions they amount to a considerable sum; and in the hands of the bankers who are in touch with business men, a large part of this eventually is loaned to manufacturers and to merchants. The savings bank is only one part of the gigantic mechanism of investment. Other banks, promotion companies which retail the stock of new corporations by salesmen direct to the small investor, brokerage houses, life insurance societies, and other financial institutions—all are engaged in collecting and directing this flow of stored-up money

capital into the channels of production. By their aid the store of capital saved by the nation is put into the hands of employers, who use it to set laborers to work to produce the costly and varied capitalistic machinery which renders modern production so tremendously effective.

Maintenance of Capital.

Saving and labor are necessary not only for the production of capital but also for its maintenance. The productive equipment of society is continually wearing out, buildings are deteriorating, machines are depreciating or becoming obsolete, and it is essential for the efficiency of production that the capital equipment be maintained in first-class condition. Part of the savings of the nation must be used in the form of a replacement fund, to employ the labor necessary to repair and reconstruct the capital goods destroyed. We have already referred to the manner in which business men replace used-up capital goods and take care of the wear and tear on fixed capital by means of the depreciation account. In replacing a worn-out machine, the business man does not, of course, directly employ the labor used in its construction; but the machine which he buys has come into being as a result of other money capital being used to set free labor for its production; in like manner, the raw materials used in its construction have been produced by still previous capital used in the extractive industries in the same manner. In buying a machine, therefore, which has been made in anticipation of his needs, a business man is reimbursing other producers who have borrowed money and used it to hire labor to the end that his machine can be replaced when worn out.

The Significance of Modern Capital Lies in Its Superior Productivity.

The original and ancient conception of capital was that of durable wealth stored for future use. The term "capital" comes from the Latin *capita* and dates from the period when capital wealth was measured by the number of head of cattle owned. While simple tools formed part of the capital of ancient times, the bulk consisted of durable goods such as cattle, wheat, flour, wool, cloth, or the gold and silver that could be used to purchase these in the future. These might be termed "direct capital."

Surplus labor was turned into durable wealth, which was saved and used to satisfy future wants directly.

But our modern system of industry employs indirect methods. Labor is employed first to produce machines, plant and equipment, and the wealth necessary to maintain and operate the labor force engaged in the long-time processes by means of which raw materials are worked up into finished products. Instead of making wealth by hand, as under the handicraft system, today we produce it under a system of organized mass production in which labor works up our raw materials into finished products, through the agency of highly ingenious machines powered by natural forces. It was said that the real wealth of a nation did not spring from its factories, machines, and so on, but from its man power. This is fundamentally true, but the reason behind it lies in the fact that man, through the agency of science and invention, has applied his brain to the invention of ingenious machines, has successfully discovered and harnessed natural forces to drive these, and, finally, has devised a highly effective system of organization for the direction and control of the whole.

It is said that we are living in a machine age; it is also said that our present system of industry is capitalistic. The latter is largely the result of the former. To produce as we produce today in the United States has involved the expenditure of a vast amount of past labor. The results of this expenditure of labor we have with us today in the form of factories, railroads, motor vehicles, stores, machinery, etc., comprising a productive equipment as fine as that of any nation in the world. Gold we also have in abundance and other kinds of money, but the chief use of money in industry is to facilitate the exchange of other capital goods, and it constitutes but a small part of our capital wealth. The great change that has taken place in the nature of capital can be clearly seen by comparing, or contrasting, a cross-section of the capital wealth of an ancient nation like Greece or Rome with that of a modern nation like the United States or Great Britain. If we were to do this, we should find that while the capital wealth of an ancient nation consisted chiefly of durable goods, including gold or silver, the bulk of the capital wealth of a modern nation like the United States

consists of its factories, power plants, railroads, electric traction lines and motor vehicles, telephone system, machinery, etc.—that is, rather in its productive equipment than in its store of money or durable goods ready for consumption. This change which has occurred in the character of capital has invested capital in modern times with a new significance. It is no longer merely wealth stored for future use, simply a source of future income; it is rather a store of productive power capable of producing new future wealth. Modern capital is, in essence, future potential power for the efficient production of wealth. This potential future productive power resides in the plant and machinery which constitute the productive equipment of the nation or in its stores of raw materials or durable goods the bulk of which are either converted into productive equipment or into labor power employed to make, maintain, or operate the productive mechanism in our organized system of mass production.

Summary.

Capital is a derived factor in production in the sense that it is itself a product of nature and labor. It comprises all intermediate products used for the purpose of further production. These are sometimes classified as fixed and circulating capital goods. Those that endure for several periods of production are termed "fixed," while those whose values are completely transferred to the product of the current period are termed "circulating." Capital comes into existence and is maintained through saving and labor. Modern capital is dynamic in character, consisting largely of productive plant and machinery.

Test Questions

1. Explain why capital is referred to as a "derived" factor of production.
2. What is a good definition for "capital"?
3. Name the eight heads under which the nation's capital goods may be classified.
4. Why distinguish between capital and consumption goods?
5. What is the distinction made between fixed and circulating capital?
6. How does capital come into existence?
7. How is it maintained?

CHAPTER VII

THE TWO IMPORTANT FUNCTIONS PERFORMED BY CAPITAL IN MODERN PRODUCTION

Our investigation into the nature of capital reveals the fact that it performs two distinct though interdependent functions in production: It serves, first, as an instrument by means of which the productivity of labor is increased; second, as a store of wealth by means of which labor is able to be employed in the profitable but long-time system of modern production.

THE EVOLUTION OF THE INSTRUMENTS OF INDUSTRY

It has been said that what distinguishes man from all other animals is the fact that he is a user of tools. Certainly, placed in a state of nature without them he would be a most helpless creature. Between the flint-headed spear and the automatic rifle, the stone hammer and the steam hammer, there stretches a period of time usually estimated at 200,000 years during which man has risen from the condition of a creature scarce able to wrest a subsistence from nature to a position of supremacy as a member of a civilization that by virtue of its mastery over the forces of nature satisfies his wants on a scale so lavish that the very poorest enjoy comfort that even kings once never dreamed of. The economic progress of the race is in no other manner so fascinatingly revealed as in the evolution of the instruments used by man on his way from savagery to civilization.

Development of Machinery.

The most important feature of this evolution has been the development of machinery. The history of production might be divided into two periods, that of the tool and that of the machine. The first dates from the time of primitive man to the

middle of the eighteenth century, during which man fashioned the materials of his work by hand with tools, many of which, like the old-fashioned spinning wheel of seventeenth-century England, he had used for ages in much the same form. The second, starting in the eighteenth century with a remarkable series of mechanical inventions and the application of steam power to the driving of these, ushered in the era of machine production which is in full swing today. The chief cause of the transition from handicraft to machine production was the invention of mechanical contrivances to operate the tools previously guided directly by the human hand. Just as soon as the tool is taken from the hand of man and placed in a mechanical contrivance, its essential character is changed. Man still controls it, but indirectly through a mechanism. It is this changed relationship between man and tool that constitutes the difference between a tool and a machine. The old-fashioned cobbler stitched his shoes by hand with a needle; the modern shoemaker stitches his with a needle the marvelously rapid movements of which are regulated by that complicated mechanism, the sewing machine. In advancing from tools to machine, therefore, man devises a mechanism that performs with tools operations previously performed by the workman with his tools. Up to the year 1735, spinning had always been done by hand, with the aid of the spinning wheel. John Wyatt initiated the development of machinery in the textile business by the invention of a mechanical device which he described as a machine "to spin without fingers." This was the forerunner of a series of mechanical inventions that ushered in the new period of production by machinery.

Application of Steam Power.

Having relieved himself, by the invention of a machine, of the necessity of directing the tools he worked with, man's next step was to employ some greater force than his own in driving the machine. Having only two hands, he is limited to the number of tools which he can handle. Not so with the mechanism of his invention, which from the outset began to outstrip him in the number of tools it worked simultaneously. The early developments of machinery were chiefly along this line. Hargreave's spinning jenny, invented in 1764, operated twelve

spindles; Arkwright's water frame and Crompton's spinning mule further increased the number. As the machines grew in size and complexity, they demanded a greater motor power to drive them than man power. Wyatt used horsepower, Arkwright built a small factory on the banks of the River Derwent and drove his spinning frames by water power. Neither horsepower nor water power was satisfactory; but history seems to show that whatever man needs badly enough his brain supplies. And in this instance, the urgent need for a more powerful motor force to drive the newly invented machines was supplied by Watt when, in 1784, he brought to a successful completion the invention of the steam engine in the form of his double-acting machinery-propelling engine. (As Watt pointed out at the time, his was not an invention for any one purpose but a universal agent which could be applied to all mechanical contrivances.) No sooner had this new and greater power been applied to the early textile machines than a great stimulus was given to the invention of machinery in all lines of industry, with the result that in England, by the beginning of the nineteenth century, the old handicraft system had been superseded by the new system of machine production.

Development of Motive-power Machinery.

The substitution of a natural force—steam—for human force resulted in the invention of a separate mechanism to supply the motive power for the machine. All fully developed machinery consists of three parts—the tool, or working mechanism; the transmitting mechanism; and the motor mechanism. The evolution of machinery began with the first of these, the working mechanism. The invention of the steam engine marked a new stage in its evolution, in which the development of motive-power mechanism played a conspicuous part. The ever increasing size and complexity of the working machine, the spreading of transmitting mechanisms which enabled a large number of machines to be driven by one motor created an ever increasing demand for more powerful motive mechanism. The discovery of the new motor powers—gas and electricity—with the invention of the dynamo in 1857 and the internal-combustion engine in 1876, resulted in the development of motor machinery capable of ex-

erting gigantic power. As a result, first, of the invention of working machines and, second, of the application of natural forces to the driving of these by the invention of motor machines, the world's industries in the short space of a century and a half have been completely revolutionized.

How the Instruments of Industry Increase Production.

Capital, in its capacity of an instrument, increases the productivity of labor by enabling man to utilize to greater advantage the properties of matter and the forces of nature. It accomplishes this in two ways: (1) by increasing the motive power at man's disposal, (2) by enabling him to direct motive power more effectively.

By the use of such simple mechanical devices as the lever, wedge, pulley, etc., man is able to exert greater power on the object of his labor than with his bare hands. A pole used as a lever enables him to move a block of stone that would otherwise resist his utmost efforts, just as a wedge enables him to split that stone at will. By placing wooden rollers beneath his stone, as did the Egyptians, he is able to move from place to place huge blocks, while by the use of wheels in a complicated mechanism, such as a truck driven by steam or gas, he transports his stone with ease over long distances. First, with a rock held in his hand, later with one fastened with thongs to the end of a stick, ancient man increased the power of his arm to deliver a blow. But with his steam hammer, the modern hammerman can tap an egg without breaking it or flatten a steel ingot with a blow that would put Thor himself to shame. With microscope and telescope, man has increased his power of sight; while the telephone and dictaphone have given new powers to his voice.

Not only does machinery, by means of mechanical devices and the utilization of natural forces, add to human labor power, but also it enables man to direct these powers more effectively, so that he performs more accurate work and work of a more delicate nature than he could accomplish alone. The Pratt-Whitney measuring machine, which decides the thickness of cigarette papers, measures a millionth of an inch. Whenever exact and minute measurements are required, machinery outdoes the hand. One of the greatest mechanical devices is the slide rest, invented

by Henry Maudslay early in the nineteenth century. It has been said that the influence of the slide rest on industry was as great as that of the steam engine, which, in common with all other machinery, owes its perfection to this ingenious means of giving to metallic objects the most precise and perfect geometrical forms. The secret of Maudslay's service to industry was to take the tool from the worker's hand and place it in a mechanical rest which exerts a far more even and accurate pressure than human hands are capable of. Another phase of the directive function of machinery is the accurate repetition of precisely identical movements and operations. Wherever continuity of movement is required, machinery outclasses man and as well relieves him of a monotonous task.

Increased Production through Machinery.

As a result, man, by harnessing the powerful forces of nature to modern machines, produces in greater quantity and with better quality products unattainable by his own unaided labor. Before Eli Whitney invented the cotton gin in 1793 the separation of the seed from a pound of cotton took, on an average, one day's labor. By means of his invention, a negress was able to clean a hundred pounds daily, and since then, through improvements to the cotton gin, that amount has been increased. In speaking of machinery in the shirt and collar industries, a recent government report states:

The great development of the wearing apparel industries, including men's shirts, has been coincident with the invention of special appliances and attachments adapting the sewing machine to practically all stitching processes, including buttonhole making and button sewing. By these inventions not only has the cost to the consumer been reduced to a minimum but the product is made infinitely better. Hand labor has practically disappeared in the sewing of men's shirts. Buttonhole and button-sewing machines, with a daily capacity of from five to six thousand buttonholes or buttons, have replaced the laborious and expensive methods of hand labor. In the early stages of the industry the machines were run by foot power and later on by steam but now electricity is used almost entirely. Some of these machines attain a maximum speed of 3,500 stitches a minute. Buttonhole making by hand is a tedious process, with a maximum capacity for a skilled

worker of 7 to 8 dozen buttonholes in a 9-hour day. The machine process with a fairly skilled operator yields 5,000 to 6,000 buttonholes per day.

What has happened in the shirt and collar industry is typical of what has occurred in almost all industries in the United States. All along the line, electrically driven machines, their steel hands working with marvelous power, speed, and accuracy, are fashioning the products once made laboriously by hand—and not alone the products of man's hand, but also of his head. Calculating machines of all kinds, comptometers, cash registers, adding machines, and bookkeeping machines, with their mechanical brains nerved with electricity, outstrip human brains in accuracy and speed. These are revolutionizing the office just as the earlier machines did the factory, so that the routine brain work of a modern office is largely performed by machinery.

Machinery has enabled man not only to produce products at a faster rate and of a better quality but also other products which he could never have made by hand alone. Glass cannot be made from sand by hand—many kinds of tools and machines are necessary for its manufacture. So with iron and steel and a thousand other products. Though nature neglected to provide man with wings, he has at last solved the problem of human flight with his latest machine and now flies higher and more swiftly than the birds. Already the U. S. mail is being carried by airplane, and regular aerial transportation routes are an established fact.

The Future of Machinery.

The most remarkable thing about machinery is its recency. What is a century and a half in the life history of mankind? Yet not in all the thousands of years that man was a user of tools did changes occur in his social industrial life to be compared to the revolution which has taken place during the present brief period of machine production. His accomplishments today in the eyes of his ancestors would appear miraculous. The newness of some of our modern inventions is rather strikingly brought to mind when we consider that telegraphy (1837), the oldest of the great electrical inventions, has sprung up within

the lifetime of men living today; that the dynamo (1857) is but 72 years old. It is hardly conceivable to us moderns that 47 years ago (1876) telephones did not exist; that people living 50 years ago (1878) had never seen an electric light and that electric cars (1881) were then unknown. The fact worth keeping in mind is that the evolution of machinery is forging ahead as rapidly today as it ever was. Improved machinery is constantly replacing old in every branch of industry. This is brought home to us when we consider some of our typical twentieth-century industries—industries such as the automotive, the largest single manufacturing industry in the country, the telephone and radio industries, electrical power and apparatus industries, the moving-picture industry, which were practically non-existent previous to this century—all industries based on mechanical inventions which have revolutionized our methods of doing business and our habits of living in the first quarter of this twentieth century. Electricity, say those who know it best, is but in its infancy. If the prophecy of Steinmetz is fulfilled, in a few years electrical power will be as cheap as water. Any day may bring forth a new power which will eclipse those which we now have. There is no reason why this evolution should stop. Wonderful and powerful as are the machines of today, those of tomorrow will be more so. The changes of the past presage even greater changes for the future. What they will be no man can guess; but their effect will be to lighten human labor and add to human happiness in so far as their benefits are distributed justly among all people.

The Mechanization of Industry in the United States.

During the first quarter of this century the industries of the United States have made such remarkable strides in increased efficiency as to invoke a statement from Washington to the effect that:

> . . . There is taking place in the United States today a new industrial revolution, which may far exceed in economic importance that older industrial revolution ushered in by the series of mechanical inventions which occurred in England in the last quarter of the eighteenth century, and which eventually transformed English industrial, political and social life. . . . We are at the present time experiencing what is

perhaps the most remarkable advance in productive efficiency in the history of the modern industrial system![1]

This is not the statement of a sensational magazine writer but of a member of the U. S. Bureau of Labor Statistics, Ewin Clague, after an exhaustive investigation into the labor-productivity increases in American industries. Mr. Clague's productivity indexes bear witness to some surprising advances in man-hour productivity, which distinguishes some of the leading industries of the United States.

For example, from 1899 to 1925, the productivity of labor in the iron and steel industry has increased 99 per cent. That is to say, each worker in that industry is producing practically double the quantity turned out by a worker in 1900. In the automobile industry, the productivity per worker since 1904 has been trebled, and the same astounding increase is true of the rubber-tire industry. Though all the industries measured do not show a rate of increase so high as the above, they do all register substantial advances. The Department of Commerce states that between 1890 and 1925, the combined output of agricultural, mineral, and manufactured commodities and of railroad transportation in the United States increased nearly two and one-half times; population meantime had increased but 54 per cent, so that, per capita of the total population, the output of these branches of industry increased at least 60 per cent. The output per worker for all of these industries combined increased 80 per cent. But as the hours of labor in these industries had been reduced during this period by at least 15 per cent, the increased production per man-hour had been still greater. The census figures further show that, despite the fact that we had 384,000 less workers in our manufacturing industries in 1925 than in 1923, we turned out nearly $2,500,000,000 more of products in the latter year.

Among the causes which have contributed to this remarkable increase of productive efficiency none has been more potent than machinery. The American genius for mechanical ingenuity coupled with the willingness of American manufacturers and American labor to adopt new and improved machinery and labor-saving devices accounts, to a great extent, for the present indus-

[1] Mon. Rev. Labor Statistics, July, 1926.

trial supremacy of the United States. The increased mechanization of industry can be roughly measured by the growth of power application. The total horsepower capacity of prime movers in manufacturing and mining establishments and electric plants in 1925 was approximately 57,504,000 horsepower. The corresponding figure at the beginning of this century was about 15,400,000 horsepower—the total having thus increased nearly fourfold; and as compared with 1880 the increase has been elevenfold. In manufacturing industries during the first quarter of this century, the primary horsepower per worker was doubled. In 1925, each wage earner was aided by prime movers of a capacity of 4.3 horsepower. As 1 horsepower is equivalent to the physical effort of 10 men, the average capacity of the individual worker in the United States is forty times what it would be unaided by mechanical energy. Thus, it may be said that each worker is in command of forty slaves or that the 8,000,000 workers in 1925 in our manufacturing industries were assisted by 320,000,000 mechanical robots. The combined production of all sources of power in the United States constitutes nearly one-half of the total power produced in the world.

Another factor seldom mentioned but one which is a measure of, and largely responsible for, the mechanization of America is the machinery industry, which furnishes the tools, machines, and mechanical equipment required by all other industries. The machinery industry has itself developed rapidly. The value of its products has grown from $1,500,000 in 1900 to over $5,000,000 in 1925. About 57 per cent of the world's machinery is produced in the United States, and the per capita domestic demand of machinery is larger than that of any other country.

CAPITAL AS A STORE OF WEALTH

Tools and machinery increase the productivity of labor, but they themselves must first be made, and their use involves a roundabout system of production, consisting of numerous intermediate stages, all of which necessitates a long period of time elapsing before the appearance of the finished product. Modern production begins with the extraction of raw materials, and the making of machinery involves extensive transportation, numer-

ous processes, and is carried on in anticipation of demand. It is here that capital comes to the rescue in its capacity of a store of wealth to supply the producers with the means of subsistence while they expend their labor in this profitable but long-time system of production. It is this element of time in modern production that is at the bottom of the dependence of the laborer on the capitalist. The laborer, unable to wait until the finished product of his labor arrives by the roundabout process, becomes dependent on the capitalist, who holds in his possession the means without which the productive enterprise cannot be carried out. It is evident that an individual or a community of individuals, without any stock of goods saved up from past industry, would be forced to live from hand to mouth and would gain but a bare existence; it is only after they have accumulated a surplus that they would be able to devote their energies, first, to the making of plant and machinery and then to making with these the commodities which they desire.

Growth of Capital in the United States.

Under the handicraft system of industry, the amount of capital required was small, but with the rise of machine production capital has come to be demanded in larger and larger quantities. The total manufacturing capital of the United States has grown from $533,000,000 in 1849 to over $44,000,000,000 in 1919. In 1850, the average number of employees per manufacturing establishments was 7, and the average capitalization, $4,330. In 1910, the average number of employees increased to 25, and the capitalization, to $68,638, an increase of 1,485 per cent in capital to one of 225 per cent in labor. In 1850, the average capital of an iron and steel plant was $46,700. In 1910, this had increased to $2,282,000. These figures not only illustrate the growing tendency toward large-scale production in manufacturing, which is the outgrowth of the development of machinery and division of labor, but they also reveal the remarkable increase of capital which that development has necessitated. In like manner, the other great branches of our national industries—agriculture, mining, and transportation—have demanded ever increasing amounts of capital for their operations. The capital invested in railroads in the United States increased from

$10,263,000,000 in 1900 to over $22,736,000,000 in 1925. The reports of corporations, for taxation purposes, are a pretty good indication of the amount of capital used in production, as the great bulk of industry is conducted by corporations. The combined assets of corporations in the fields of mining, manufacturing, transportation, and public utilities in 1924 were more than $90,000,000,000 of which about $28,000,000,000 was in the form of current assets, and the remainder in fixed assets—plant and equipment. In the mining industry, the assets of corporations were equal to about $10,500 per wage earner employed; in manufacturing, about $5,250; and in steam railroads about $8,000 per wage earner.[1]

Complementary Nature of Capital and Labor.

One of the most prominent rubber manufacturers said recently to an interviewer: "All the millions of dollars we have invested in this plant wouldn't be worth a cent if they were not vitalized by human effort." He might just as truly have said, "All the labor of the 20,000 men in this plant wouldn't be worth a cent if they were not equipped with capital." Both statements are equally true and reveal the complementary nature of the two factors, labor and capital. Either alone is impotent; together they are all powerful. Take the case of this particular producer. In 1898, believing that there was a future in the rubber business, but having no money of his own, he borrowed the necessary capital, $13,500, organized a company, bought a small factory building, and started in to make rubber carriage tires. In the early days of its history, the company had pretty hard sledding owing to insufficient capitalization; people did not have much faith in the rubber business in those days, and it was only by the exercise of extraordinary ingenuity and perseverance that the increasing demands for capital were met. In 1917, the net assets of this company amounted to $60,000,000. It owns one of the finest plants in the world, equipped with the latest and most efficient machinery for manufacturing all kinds of rubber products. It has acquired 20,000 acres of rubber lands in Sumatra and 24,000 acres of desert in Arizona that are being reclaimed

[1] "Commerce Yearbook," Vol. I, p. 21, 1928.

for growing long-stapled cotton and, also, owns a cotton mill in Connecticut. Its sales for 1917 reached $111,000,000.

Importance of Capital.

It is not alone efficient labor and abundant raw materials that result in industrial efficiency, but also quantity production coupled with the use of labor-saving machinery. That concern, other things being equal, which is equipped with the most efficient machinery, will produce the largest product at the lowest unit cost. To the individual and the nation alike, capital in its twofold capacity is an essential factor in the economic struggle for existence. It is obvious that a nation cannot engage in the building of railroads, canals, harbors, irrigation plants, and other profitable but time-consuming projects without capital. It is equally plain that a nation whose industries are poorly supplied with obsolete machinery will be unable to compete successfully with another supplied with a modern and superior equipment. The coming international economic struggle will hinge on machines and the capital wealth necessary to purchase them and utilize them in quantity production.

Summary.

Capital performs two functions in production. It serves as an instrument by means of which the productivity of labor is increased, and it serves as a store of wealth to support labor in the long-time system of modern production. The economic progress of humanity is revealed in the evolution of the instruments of industry. The mechanical inventions of the latter part of the eighteenth century ushered in a new era of production by machinery. Capital in its capacity of an instrument increases production by increasing the motive power at man's disposal and by enabling him to direct motive power more effectively. The mechanization of industry has tremendously increased man's power to produce wealth.

Tools and machinery must first be made, and their use involves a roundabout system of production, consisting of numerous stages all of which necessitate a stock of wealth in advance, to supply the workers with the means of subsistence until the finished products are marketed. Our present system of machine

production demands capital in ever increasing quantities. In 1919, the manufacturing capital of the United States exceeded $44,000,000,000.

Test Questions

1. What two distinct functions does capital perform in our economic system?
2. What part has the evolution of the instruments of production played in furthering human progress?
3. Wherein lies the difference between a tool and a machine?
4. What three stages mark the evolution of the instruments of production?
5. In what two ways does capital in its capacity of an instrument of production increase the productivity of labor?
6. Give an illustration of the superiority of machine production over hand labor.
7. How does capital facilitate production in its capacity of a store of wealth?
8. Give some idea of the growth of capital in the United States in the last half century.
9. Make clear the relationship between labor and capital in production.
10. Give some idea of the importance of capital in our present industrial system.

References

BÖHM-BAWERK, E. VON, "Positive Theory of Capital."
CAREY, M., "Political Economy," Part 1, Chap. XIX.
CARVER, T. N., "Principles of Political Economy," Chap. XIII.
CLAY, H., "Economics for the General Reader," Chap. V.
FETTER, F. A., "Economic Principles," Chap. XXII.
GIDE, C., "Political Economy," Book 2, Chap. III.
HADLEY, A. T., "Economics," Chap. V.
MARSHALL, A., "Principles of Economics," Book II, Chap. IV.
NICHOLSON, J. S., "Principles of Political Economy," Chap. VI.
SAY, J. B., "Political Economy," Book 1, Chap. III.
SEAGER, H. R., "Principles of Economics," Chap. IX.
SMITH, A., "Wealth of Nations," Book 2, Chaps. I–V.
TAUSSIG, F. W., "Principles of Economics," Chap. V.
TROWBRIDGE, W. P., *Report* XIX, pp. 514–544, on power and machinery employed in Manufacturers' Industrial Commission, 1902.
VEBLEN, T. B., "Theory of Business Enterprise," Chaps. II, IX.
WALKER, F. A., "Political Economy," Part 2, Chap III, 1888.
U. S. Twelfth Census, VII.

CHAPTER VIII

ORGANIZATION AS A FACTOR IN PRODUCTION

Organization in Production.

We live today in an age of organization. The achievements of the present are the result of organized effort. The individual working for himself has given away to the combination of individuals working together for a common purpose. Individual action has been replaced by collective effort. We find this evidenced in all spheres of human activity, political, social, and religious, but it is in industry that organization has achieved its most remarkable results and is found in its most highly developed state. There is scarcely a thing we use from the time of rising in the morning to retiring at night which is not the product of some organization. The bed in which we sleep, the soap with which we wash, the clothes we wear, the food we eat, the car that whirls us to and from our places of business, the telephone on our desk, all alike are the result of organized effort, and, moreover, without organization they would not be produced at all. In organization we moderns live, move, and have our economic being.

Reason for Its Inclusion.

Following the lead of Adam Smith, it has been customary to consider land, labor, and capital as the sole factors of production. Since the time when he wrote his famous "Wealth of Nations," changes have occurred which seem to make it advisable to segregate organization as a separate factor in production. The industrial systems of the leading countries of the world have evolved a complexity of structure compared to which that of the time of Adam Smith seems simple. New problems have arisen, intricate problems, urgent problems on the solution of which hang the happiness of the workers and the welfare of the nation.

Large-scale production incurring the use of tremendous sums of capital invested in quantities of modern machinery entailing the employment of an army of workers engaged in a multiplicity of varied activities, all operating under a central control, have brought into prominence the economic unit itself, which, in the course of its evolution, has developed a size and complexity of structure worthy of special consideration. The productivity of any nation today depends as much on the character of its business organizations as on its natural resources, its labor force, or its capital; for it is only through the former that the latter three are united for effective production. There is a more urgent need today for a close study, an accurate knowledge, and a clear understanding of the underlying principles of business organization than at any other period in the country's history. To place it in the position of a separate factor of production will single it out for attention and study.

Organization Defined.

In the separate discussion of land, labor, and capital, we have naturally enough emphasized their individual importance. It is just as necessary to realize their absolute interdependence. Under our modern industrial system, with its large-scale production and division of labor, either factor by itself is comparatively helpless; only when working together are they effective. It follows, therefore, that the structural unit by means of which they are combined for effective production is performing a highly important function. Organization as a factor in production may be defined as an arrangement of land, labor, and capital for the purpose of producing commodities or services. Every business concern is such an arrangement.

Essentials of Organization.

What are the dominant characteristics, the fundamental features of organization in general? A grasp of these will give us a keener insight into the nature of business organization. Organization has been variously defined as: "The act of arranging or an arrangement of related or interdependent enterprises into a group with such system as will enable and make it possible to compel each to cooperate harmoniously with the others in the

accomplishment of a common end." "A harmonious arrangement of specialized parts for the accomplishment of a common purpose." "A living structure composed of organs." "A systematic union of individuals into a body whose officers, agents, and members work together for a common end." An analysis of these definitions shows that all organization involves, first, an arrangement; second, specialized parts; third, some form of centralized control; fourth, a common end or purpose. In short, the essentials of organization are:

1. Arrangement.
2. Specialization.
3. Centralization of control.
4. Unity of purpose.

Arrangement.

An organization *is* an arrangement, a contrivance. To organize is to arrange, and on the arrangement depends the successful operation of the organization. The object of arrangement is coordination. The interdependent parts of which the organization is composed must be so placed that their activities coordinate. In the human body, the parts are so related that they coordinate perfectly, each performing its function in the general scheme of things and all working together for the common good. The organs of the digestive system—mouth, tongue, esophagus, stomach, and intestines—are so combined that together they function to digest food. In the same way, the departments of a factory are so arranged that together they function to manufacture a product. But while in the human body the arrangement is contrived by nature and the organism comes into being already developed, in the business organization the arrangement is undertaken by man, who must perform the work of construction. His raw materials are land, labor, and capital, in the form of men, money, machinery, materials, and plant, and his problem is to arrange them in such a manner that they function to produce commodities or services. The departments of a manufacturing plant, for instance, must be so related that the raw materials which enter at one end pass from department to department without any back handling till shipped out as fin-

ished products at the other. Men and machinery must be so coordinated that they work together to the best advantage. Time- and motion-study work consists largely of an arrangement among the man, the material, and the machine; the position and the motions of the worker are so ordered that the job is done in the shortest time with the least expenditure of effort. This is scientific organization of the job—an arrangement based on systematic observation, not on rule of thumb or guesswork. Organization throughout is a matter of arrangement.

Specialization.

In this arrangement, nothing is more vital than the specialization of its parts. An organization does not consist of one individual but of a number of individuals; it is not a homogeneous whole but a heterogeneous whole composed of different parts. This is true of every kind of organization, whether it be an animal organism, a baseball team, or a business corporation. In each, the end or purpose is accomplished by a number of differing individuals or parts, each adapted to execute some particular activity. In the animal organism, the eye does the seeing, the ear the hearing, and the feet the walking; in the winning of the baseball game, each member of the team has his special work of catching, pitching, or fielding; and in the business corporation, each department has its own special function—the sales department is organized to take care of the selling activities, the purchasing department does the buying, and so on. A specialization of parts based on functions is the very essence of all organization. In animal organisms, as we have noticed, the higher the organism in the scale of life the more highly specialized are its parts. The same law applies to business organizations, which have evolved from the individual producer who carried out all of the simple functions of business himself to the most modern development, the big corporation with its numerous highly specialized departments, machinery, and workers. In organization, specialization is synonymous with progress. The most efficient business organizations are those in which specialization of departments—men, machinery, and equipment—has been carried to a high degree. The work of organizing is largely a matter of this specializing—first, in determining the

divisions and departments best adapted to the carrying out of the various activities, and then in the building up of these with specialized men, machinery, and equipment. Specialization, therefore, is a fundamental principle of organization.

Centralization of Control.

As an organization consists of a number of separate parts, some means of centralized control is essential to secure the coordination of their activities in the accomplishment of the common end. All kinds of organization possess some form of centralized control. Provision for this office is the predominating feature of modern business organization. In man, the cerebrum, the throne of the mind, is the center of control; in it dwells the "I," the "thinker," who, through the lower nerve centers, directs all the members of the body according to his will. In the business corporation, the center of control is the board of directors; from this body the control passes to the executive department, the general manager, and from him down through the whole organization. This principle of centralization of control is carried out through every part of the organization. The control of each department is centralized in the head of that department, just as that of the whole organization centers in the board of directors. The more highly specialized the organization, the more numerous its parts, the more complex it is the more necessary is some form of centralized control to secure unity of action.

Unity of Purpose.

Arrangement, specialization, and centralization of control are all means for achieving the purpose for which the organization was brought into being. Each part of the organization exists solely for the sake of contributing in some special way to the accomplishment of this common end. In a steel plant, every department, every building, every machine, and every man is there to help make steel. The making of steel should be the common tie that binds them into a working whole. A great deal of friction and waste effort would be avoided in business concerns today, were the common aim more clearly kept in mind by the

separate departments and individuals. Unity of purpose inspires cooperation and is essential to all organized effort.

FORMS OF BUSINESS ORGANIZATION

The Sole Proprietorship.

The simplest form of business organization is the one-man business concern, often called "sole proprietorship." One man owns and controls the whole undertaking. It is the parent form of business organizations, and in its crudest state, way back in primitive times, one man not only owned and controlled the business but also performed all of its various functions himself. In its more highly developed state it appears as a highly specialized organization owned and controlled by one man, as the John Wanamaker and Marshall Field stores were previous to their incorporation. It was the typical form of organization of the handicraft system in the Middle Ages and is the prevailing type today in farming, retailing, and the professions. In 1900, there were 171,000 establishments under individual ownership, forming 63 per cent of all establishments. In 1904, the number had dropped to 113,900 and 52.7 per cent of the total. In 1909, the percentage of the total was 52.4 per cent. The value of the products produced by individually owned establishments shows the same tendency, falling from 16 per cent in 1900 to 12 per cent in 1904 and to 10 per cent in 1909.

The advantages of the sole-proprietorship form are (1) ease of starting; no articles of agreement need to be drawn up or certificate of incorporation obtained; (2) close relationship among interest, authority, and responsibility—the person who has everything to lose or gain by the management of the business has that management entirely in his hands. This acts as a direct check on waste and is an incentive to efficiency; (3) centralization of control allows a promptness and facility of action not so easily attained in a complicated organization. Its disadvantages are

1. The one individual lacks the breadth of knowledge and ability contained in the personnel of the partnership or corporation.

2. Difficulty in raising sufficient capital.

3. The unlimited liability of the sole owner for the debts of the business.

The Partnership.

With the introduction of machinery and the spread of division of labor, there was a gradual development of the business in size and complexity of structure. It became increasingly difficult for one man to raise sufficient money or to assume the control and direction of the larger quantities of men, machines, equipment, and plant demanded by the enlarged unit. The sole proprietorship was thus supplemented by the partnership form of organization, wherein two or more individuals formed an association for the purpose of conducting a business, sharing in the ownership and control according to an agreement among themselves.

Like the sole proprietorship, the partnership has the advantage of facility of formation; there is, also, a direct relationship between effort and reward which acts as a stimulus to efficient management by the owner. It possesses an advantage over the single entrepreneur form in that the combined ability of several heads allows some degree of specialization in control and management, and, also, its borrowing capacity enables it to raise larger sums of capital. It lacks the centralized control of either the sole proprietorship or the corporation.

This divided control has often been a serious disadvantage in partnerships, causing lack of harmony and lack of unity of action. Though able to raise larger sums of capital than the single entrepreneur, the partnership's capacity in this direction is inferior to that of the corporation. Liability to disruption is another disadvantage of the partnership which may take place by the death, insolvency, or withdrawal of one of the partners. Finally, the unlimited liability of the partners for debt is a decided disadvantage of the partnership form of organization.

The Corporation.

As a result of a long process of evolution from the individual entrepreneur, the partnership, and a transition from the joint

stock company, rarely found in the United States though still common in Great Britain, we have arrived at the corporation, which is the prevailing type of organization today. It is estimated that in 1800 there were 100 corporations in the United States. But the era of the industrial corporation as we know it today did not set in until after the Civil War. The number increased rapidly after 1870, and in 1900 there were 37,123 establishments operated by corporations, representing 17.9 per cent of the total number of establishments. In 1919, the number had increased to 91,517, representing 31.5 of the total number of establishments. These figures do not indicate the full importance of corporations in national industry. Their importance is more evident when we find that they employed 86 per cent of the wage earners of the country and produced 87.7 per cent of the total value of the products. Table II on page 110 shows very clearly the elements of and the changes in the character of ownership in the United States from 1904 to 1919.

The largest number of corporations is found in industries in which large capital investments are necessary, and whose operations involve the control of large masses of men, money, machinery, and materials. Data on this point are furnished by Table III on page 111, prepared by W. L. Thorp of the Census Bureau. Here are listed the thirteen industries in the United States operating on the largest scale, ranked in order of their size, as determined by number of wage earners and value of products, with the percentage of establishments which are corporately owned. This demonstrates the relationship between large-scale production and the corporate form of organization. The corporation makes expansion possible, and large-scale production demands the corporation successfully to carry on its large-scale operations.

The corporation comes into existence and is maintained by virtue of the general state corporation acts. Under such an act any citizens who meet the requirements of the law may form a corporation by drawing up according to form a charter or certificate of incorporation, on the acceptance of which by the proper officer of the state the corporation comes into being. It is thus a creature of the state; its certificate of incorporation is its birth certificate, wherein its powers are defined and certain rights granted. It is a legally constituted association of

TABLE II.—ESTABLISHMENTS, WAGE EARNERS, AND VALUE OF PRODUCTS, BY CHARACTER OF OWNERSHIP, 1904 TO 1919

Census Monographs III

Character of Ownership	Establishments		Wage earners		Value of products	
	Number	Percentage distribution	Number	Percentage distribution	Amount, millions	Percentage distribution
All classes:						
1904	216,180	100.0	5,468,383	100.0	$14,794	100.0
1909	268,491	100.0	6,615,046	100.0	20,672	100.0
1914	275,791	100.0	7,036,247	100.0	24,246	100.0
1919	290,105	100.0	9,096,372	100.0	62,418	100.0
Individuals:						
1904	113,946	52.7	755,923	13.8	1,703	11.5
1909	140,605	52.4	804,883	12.2	2,042	9.9
1914	142,439	51.6	707,568	10.1	1,925	7.9
1919	138,112	46.6	623,569	6.9	3,536	5.7
Corporations:						
1904	51,097	23.6	3,862,698	70.6	10,904	73.7
1909	69,097	25.9	5,002,393	75.6	16,341	79.0
1914	78,152	28.3	5,649,891	80.3	20,183	87.7
1919	91,517	31.5	7,875,132	86.6	54,745	87.7
All other:						
1904	51,137	23.7	849,762	15.5	2,187	14.8
1909	58,385	21.7	807,770	12.1	2,289	11.1
1914	55,203	20.0	679,788	9.6	2,138	8.8
1919	60,476	20.8	597,771	6.6	4,137	6.6

individuals authorized by law to conduct business as a single entity.

The advantages of the corporation are

1. Greater permanency; the individual members may die or retire, but the corporation continues its existence as a distinct entity.

TABLE III.—CORPORATE OWNERSHIP IN THE THIRTEEN INDUSTRIES LEADING IN TERMS OF LARGE-SCALE PRODUCTION, 1919

Census Monographs III

Industry	Rank		Establishments		
	According to wage earners [1]	According to value of product [2]	Total Number	Operated by corporations	
				Number	Percentage of total
Sugar refining	1	1	20	17	85.0
Boots and shoes, rubber	2	5	25	24	96.0
Smelting and refining, copper	8	5	34	34	100.0
Iron and steel, steel works, rolling mills	5	10	500	481	96.2
Shipbuilding, steel	3	13	162	148	91.4
Belting and hose, rubber	9	7	15	15	100.0
Smelting and refining, lead	12	3	25	24	96.0
Locomotives	6	11	17	16	94.1
Smelting and refining, zinc	13	6	39	39	100.0
Cars, electric railroad	7	14	7	6	85.7
Iron and steel, blast furnaces	16	9	195	187	95.9
Ordnance and accessories	10	15	26	25	96.2
Cars, steam railroad	11	16	99	98	99.0

1 According to proportion of establishments employing over 250 wage earners.
2 According to proportion of establishments producing over $1,000,000 products.

2. Limited liability; the liability of each stockholder is usually limited to the amount he has invested in the company.

3. Facility for raising large amounts of capital by selling the capital stock to numerous small shareholders. The tremendous sums of capital required by large-scale production can be raised. Transferability of stock plays a large part in this.

4. Centralization of control and direction; the binding legal constitution of the corporation with its provision for the concentration of control in the board of directors makes for unity of action.

There are several disadvantages of the corporation form. Its formation necessitates the expense and formality of filing with the state a certificate of incorporation. Its powers are restricted to the definition of its purpose in this document. It is subject to stricter supervision and regulation than the sole proprietorship or the partnership. Through the separation between ownership and management which occurs in the large corporation, the spur to efficient management is often dulled.

Financial Organization of a Corporation.

The capital of a corporation is raised by issuing and selling shares of stock or by borrowing through bonds or notes or by both of these means. The capital stock issued represents the value of the real capital of the corporation, that is, the value of its assets both tangible and intangible, and is divided into shares of $100 or other stated amounts. A share of stock, or a "stock certificate," as it is termed, is a property right, an evidence of ownership of part of the capital stock of the corporation, invested with certain rights such as the right to share in the earnings, the right to vote, etc. The total amount of capital stock which the corporation is authorized to issue constitutes its "capitalization," though the term "capitalization" is often popularly used to include capital borrowed by issue of bonds. The stock may be sold direct by the promoters, or, as is usually the case in large issues, it may be "underwritten" by a syndicate or investment house, in which case the sale is assured by the investment company who undertake to market the issue either on a percentage basis or at a profit by buying at one price and selling at a higher.

The stock issued may consist of common stock or preferred stock or both. Preferred stock derives its name from the fact that it has a preferred claim on the earnings and, also, on the assets of the corporation in case of liquidation over that of the common stockholders. This does not mean that owners of preferred stock are guaranteed dividends, for if the company fails to make a profit no dividends will be paid. But before anything is paid on the common stock, a specified dividend rate such as 7 per cent must be paid on all outstanding preferred stock. "Cumulative preferred" stock entitles the owner to the payment

of back dividends, that is, to the payment of dividends which have been missed in previous years when earnings have been low. It sometimes has the privilege of sharing in earnings with the common after the common has received a certain rate of dividend, in which case it is called "participating preferred" stock. Quite often, preferred stock does not have voting power.

Owners of "common stock" have no assurance of receiving any stated rate of dividends. But on the other hand, neither is there any limit placed on the share which they may receive. If earnings are only sufficient to pay the specified rate of dividends to the preferred stockholders, the holders of common stock receive nothing; should the business fail, they are the last to share in the remains. If success, however, brings large profits, they claim the lion's share. It is quite usual for common stock to possess exclusive voting power. The control of the corporation resides in the hands of the holders of common stock. This permits control, also, to pass into the hands of a few owners of the common stock of a corporation. Owing to the prevalent custom in the United States of voting by proxy, 51 per cent or less are often able to control the affairs of the whole corporation. It is customary to finance highly speculative ventures, such as mining and oil companies, through the issuance of common stock alone. Those who invest in these want large gains. Industrial corporations that are closely held and whose growth has been gradual and financed from earnings, such as the Pullman Company and the Singer Manufacturing Company, also confine themselves to common stock.

A large part of the capital funds of corporations is borrowed through bonds and notes. A bond is simply an evidence of indebtedness and a promise to pay the principal at a definite place and time and the interest at stated times. A bondholder is not an owner, therefore, of the corporation but a creditor. He has no vote or control over the affairs of the corporation, except in the case of foreclosure, when the management may pass into his hands. His interest must be paid or he can foreclose. He has a first lien on the assets of the corporation in case of liquidation.

A corporation may borrow part of its capital by means of short-term notes. The large meat packers resort to this method extensively. In periods of unusually high interest rates on long-

time loans, such as confronted corporations during the World War, the management may deem it unwise to assume permanent obligations of this nature and will meet the situation by resort to short-term notes running from two to five years. When these mature, bonds can be issued and the proceeds used to pay off the notes. Another method by means of which a corporation may side-step high interest rates is by issuing callable bonds. These are usually long-term bonds in which the right of repayment at a certain figure is reserved for a definite date. The 7½ per cent bonds of the E. I. DuPont de Nemours and Company, for instance, are due in 1931, but the company reserved the right to pay off the issue in whole or in part at sixty days' notice at 110 per cent, prior to May 1, 1922, or at any time thereafter at a price decreasing 1 per cent every year. By this arrangement, a corporation is enabled to issue bonds at a lower rate of interest, should the market permit it in the future, and avoid the handicap of permanent high rates. The investor is also compensated, should he be called upon to accept payment before the due date and forced to rearrange his investments.

The advantage to the corporation from borrowing part of its capital funds at a fixed rate of interest lies in the fact that after this limited rate is paid, a larger share of the earnings is left for distribution among the stockholders. The advantage to the investor lies in the fact that he is relieved of a large part of the risk involved in the enterprise and of responsibility of management. The bondholder is essentially a capitalist who loans his savings to the corporation, which converts it into productive capital and pays him a stipulated sum for its use and as compensation for waiting. Of the three forms of corporate securities bonds are the safest and involve the least responsibility on the part of the investor and, consequently, bring in the least return. Preferred stock comes next with a fixed rate of return, larger than the return from bonds but contingent upon the prosperity of the enterprise. The preferred stockholder takes some share in the risk but little in the management, though he is an owner of the enterprise. Common stock shoulders the brunt of the risk and in it is vested the control of the enterprise and the responsibility for its direction. The owners of common stock stand to lose or gain the most. They come the closest to being entrepre-

neurs and often are. While they bear the financial risk of the enterprise, in practice they delegate their power of control and responsibility of direction to others within the organization.

Internal Organization of a Corporation.

We have discussed the chief forms of organization mainly from the viewpoint of ownership and have noticed their external characteristics. We will now glance at the internal arrangement of a typical corporation. Commencing with the big divisions and working down, we find the corporation to be divided into two main parts one of which is devoted chiefly to administrative affairs and is termed the "corporate" or "administrative organization"; the other, devoted to the direct production of the commodity or service, is usually called the "operating" or "production organization." Both, of course, are concerned in the production of the commodity and both exercise administrative powers, but each is named after its predominant function.

The Corporate or Administrative Organization.

The purpose of the administrative organization is to control and direct the affairs of the whole corporation in behalf of its owners, the stockholders. It is the means by which the stockholders exercise their functions of ownership—and control. It constitutes the governmental structure of the corporation and consists of the stockholders, the board of directors, the executive, the general manager. The body of stockholders represents the ownership of the corporation and is the ultimate source of authority and control. Then come the board of directors elected by the stockholders and endowed by them with full authority to control and direct the affairs of the corporation. The board of directors is thus the center of control and direction for the corporation as a whole. It carries out its policies and plans through its executives. The executive department exists to execute the directions of the board. In the smaller corporation, the chief executive is the president who exercises full supervision over the business and is directly responsible to the directors. In the larger corporation, there is usually an executive committee, the chairman of which is the chief executive. Other executive officers are the secretary and treasurer. The general man-

ager is often classed with the operating organization; his function, however, is administrative. He is the connecting link between the two organizations. He is appointed by the president or the directors and is responsible for the success of the operating organization. He is the center of control and direction for the operating division, and his function is to correlate the various departments and coordinate their activities, so that all the parts work smoothly and efficiently together to turn out the largest amount of product at the lowest unit cost.

The Operating Organization.

While the direct object of the corporate organization is the general administration of the affairs of the company, that of the operating organization is the production of the commodity or service for which the corporation was formed. To accomplish its purpose in the most efficient manner, the operating division is divided into four main departments—the production, the sales, the financial, and the accounting departments, which correspond to the four universal functions of business. Every concern is producing a product, whether it be some concrete commodity such as steel, shoes, or locomotives or some intangible thing such as transportation, a bank's service to its depositors, or a store's service to its customers, which necessitates, first, the buying of some commodity.

The actual making of the product is the primary object, and the internal organization must, therefore, contain a department to perform the service or to carry on the work of manufacture, to secure the raw material and work it up into its finished state. The product is of no use lying in the factory; it must be sold. The selling function varies in importance in different kinds of business but is present in all in some degree. A well-organized sales department is a vital necessity to the modern corporation. No less so is a good financial department. Manufacturing and selling cannot be carried on without money. The financing of a business in this capitalistic age is no mean task and demands specialized ability. A separate department is required to take care of financial operations, to procure funds, collect debts, and disburse moneys. Last, but not least, is the function of accounting. A record must be kept of all the trans-

actions of the business, of all expenses and income; otherwise, affairs would end in hopeless confusion. The accounting department attends to the recording of business transactions, evidences the assets and liabilities, summarizes the income and expenses, and submits such other financial and statistical statements as the executives can use.

These four departments which are included in a typical operating organization are further divided into those subdepartments and sections best fitted to handle their varied activities. The sales department may include an advertising department, a correspondence department, a training division, or whatever other departments are necessary to carry out most effectively the selling plans of the company. No two organizations are exactly alike. The number and arrangement of the departments will depend on the nature of the work to be done. If this principle of division based on functions be carried out through the entire organization from the main division, through the departments and subdepartments to the men and machines, labor and capital will be most economically employed and every individual will be performing that special function for which his special ability fits him. This division must be accompanied by such an arrangement that the separate activities of these specialized parts coordinate perfectly. Unity of action will be secured by centralization of control and cooperation inspired by the common purpose. The complete organization may be likened to a wheel the hub of which represents the corporate organization from which control radiates through the spokes to the rim, which represents the operating division. This arrangement illustrates the central position of the general manager, who through his four department managers directs and coordinates the activities of the various departments and subdepartments of his entire organization.

Summary.

Organization is the keystone of the arch of production. By it, the other factors—land, labor, and capital—are locked into a productive unit. Alone, these others are helpless; only when combined in some form of organization are they capable of effective action in our modern industrial system. Business

organization, therefore, demands special attention; the best brains of the nation should be focused on its problems and its principles. Organization means arrangement; it involves specialization of parts, which, in turn, necessitates centralization of control, to coordinate the functions of the parts and to secure unity of action, for the attainment of the common purpose. Arrangement, specialization, centralization of control, and unity of purpose—these are the root ideas of organization. From the standpoint of production, a business organization is an arrangement of men, money, machinery, and materials for the purpose of producing a commodity or service. The chief forms of business organization are the sole proprietorship, the partnership, and the corporation. The capital funds of a corporation comprise owned and borrowed funds, which are raised by the issue and sale of corporate securities the chief classes of which are common stock, preferred stock, and bonds or notes. The internal organization of a corporation is based on functions. The work of the corporation is divided and subdivided into separate activities, and special departments are created to discharge these activities. Harmony of action is induced by centralization of control.

Test Questions

1. What is a business organization?
2. State the four essentials of organization.
3. What part does arrangement play in organization?
4. What is the relation of specialization to organization?
5. Of what importance is centralization of control in organization?
6. What are the chief forms of business organization?
7. State the advantages of the corporation form of organization; its disadvantages.
8. Draw a chart showing the chief parts of a typical business corporation.
9. What is the function of organization as a factor in production?

CHAPTER IX

LARGE-SCALE ORGANIZATION

DEVELOPMENT OF THE CORPORATION

The corporation, which, as we have seen, permits a greater degree of specialization and integration than previous forms of business organization, has itself undergone changes in size and form. Since 1870, there has been a remarkable development of the corporation form of organization both in size and in complexity of structure. The growth of large-scale production, which has been made possible by the widening of the market and by the bringing together under the centralized control of the corporation ever larger quantities of men, money, machinery, and materials, has resulted in an extension of the corporation form into the holding company and merger.

The holding company, which appeared in 1897, and which is the dominant form of large corporations today, is a combination of smaller corporations the stocks of which it acquires either in whole or in part, sufficient to give it control of the constituent companies. Centralization of control is thus secured through the board of directors of the holding company. In the merger, which began to assume importance about 1905, the stock of the constituent companies is brought in and cancelled, the only stock being that of the owning corporation. This represents the last stage in the development of corporate combination, wherein the combined companies completely lose their identity in the parent company and a unified and centralized organization results. The earlier corporations were associations of individuals into a simple organization; the big corporations of today are associations of already organized individuals or corporations into compound organizations. The trend of development has been from the simple to the complex corporation.

Development by Combination.

The most modern phase of corporate development has come about as a result of a process of combination. The first period of development consisted of an internal growth and expansion of the simple corporation which rapidly increased in size. The process of combination by means of which these enlarged units have been compounded into the gigantic corporations of the day has proceeded along two different lines usually termed "horizontal" and "vertical."

By horizontal combination is meant the union of firms making the same kind of products, as, for instance, in the tobacco industry, there is a combination of firms making cigarettes and another of those producing tobacco.

In vertical combination, firms engaged in different stages of production are united under one management, as in the United States Steel Corporation, which includes companies engaged in the extraction of raw materials, that is, ore and coal companies; coking concerns; railroad and steamship companies; makers of pig iron and crude-steel products; and, lastly, finishing concerns. Vertical combination is, in reality, integration, a coordination of related or interdependent activities into one organic whole. As used in economics, integration may be defined as the process whereby the owners of an enterprise secure a more or less complete control of all the steps of production, from the extraction of the raw materials to the marketing of the finished product. In most industries, specialization has resulted in the different stages of production being conducted by separate companies. In the steel industry, separate concerns carried on ore mining; others smelted the ore into pig iron. Still others mined the coal and made it into coke. The pig-iron producer sold his product to the puddler or steel maker who, in turn, sold his crude steel or iron to the makers of finished products. Vertical combination or integration is the process whereby these specialized, yet interdependent, concerns are welded into one unified organization which controls and coordinates all of the essential activities of production from the mining of the raw material to the marketing of the finished product.

Large-scale Organization in the Steel Business.

In the march of events in the steel industry, leading up to the formation of the United States Steel Corporation, it is possible to see the action of combination on a gigantic scale. The early conditions existing in the steel industry were well told by Percival Roberts in his testimony in connection with the case of the steel corporation.[1] Mr. Roberts said that the firm of A. & P. Roberts, with which he had become connected in 1876, had been started by his father and another in 1852 with a capital of only $8,000, which was considered sufficient in those days to start a works for producing wrought iron; that practically all rolled products were made of wrought iron which was produced in puddling furnaces; that a puddling furnace had a capacity of about 4 tons of muck bar in twenty-four hours and was operated by four men; that there was no continuity of operations in those days, that after the pig iron had been made in the blast furnace, it was shipped to the rolling mill where it was charged cold into a puddling furnace and converted into "muck bar," which again was permitted to become cold, after which it was cut into various sizes, then reheated and rolled into finished products. He said that in 1876 the total production of pig iron in the United States was less than 2,000,000 tons per annum, as against nearly 30,000,000 at the present time.

He said that in 1885 two Englishmen, Thomas and Gilchrist, discovered that it was possible to remove phosphorus from pig iron during the manufacture of steel by the use of lime in the heating furnace; that this discovery practically revolutionized the iron industry; and that by the year 1890 steel had practically supplanted wrought iron for commercial purposes. He said that in the late 'eighties the introduction of electricity as a motive power so transformed the industry that all works had to be rebuilt if the manufacturer desired to keep abreast of the recent developments of the art; that a little later the Jones mixer, which enabled the production of steel to be carried on as one continuous operation from the ore to the finished product, never permitting the material to become cold until it reached the final marketable shape, again materially changed the situation. He said that

1 United States of America and U. S. Steel Corp., Argument.

these changes increased the economic unit of manufacture from a group of puddling furnaces, having a capacity of forty tons in twenty-four hours, to a steel works having a capacity of a thousand tons in the same time.

The gradual growth of the individual plants, due to the technical improvements mentioned by Mr. Roberts, was followed by a period of lateral combination, culminating, between 1898 and 1900, in a series of giant consolidations with capitalizations ranging from $30,000,000 to $100,000,000, each constituting a union of concerns manufacturing a like or related product. These may be divided into two groups: The primary group consisted of concerns engaged in the production of iron ore and the crude and semifinished steel products; chief among these concerns were the Lake Superior Consolidated Iron Mines Company, the Carnegie Company, the Federal Steel Company, and the National Steel Company. The second group contained the manufacturers of finished-steel products; the majority of the tin-plate plants were united in the American Tin Plate Company, incorporated in New Jersey in December, 1898, with a capitalization of $46,000,000; the American Steel and Wire Company, which was organized a month later with a capitalization of $90,000,000, secured all of the leading concerns producing wire nails and wire products; the other great consolidations of the secondary group were the National Tube Company, the American Steel Shop, the American Sheet Steel Company, and the American Bridge Company, each of which, likewise, was a combination of the leading concerns in its particular branch of the business.

The next step was taken when these huge concerns began to integrate, each endeavoring to attain independence by linking up under its control all of the successive stages of steel making from the mining of the ore to the marketing of its finished products. For great as these corporations were, they were by no means self-sufficient. Up to 1898, there had been little integration in the steel business, with the exception of the Carnegie and Federal companies. Andrew Carnegie, back in the 'eighties, had shrewdly foreseen its advantages, with the result that the Carnegie Company was highly integrated; so, also, was the Federal; but neither sufficiently to cope with the extraordinary situation that arose in 1900. The large steel-making companies

finally recognized the paramount importance of securing an adequate supply of raw materials, and by 1900 the bulk of the ore deposits and coking coal gravitated into the possession of less than a dozen concerns. These companies, though highly integrated on their raw-material side, depended on the finished-steel concerns to purchase their semifinished products. On the other hand, the finishing concerns did not produce their own steel but purchased it from the crude-steel-making companies. The movement of integration was by no means destined to be a peaceful one. In their efforts to link up the chain of production, the giants began to invade each other's territory. The finished-steel-products companies began to reach back and secure ore deposits and to erect crude-steel plants. The crude-steel concerns, thus deprived of a market for their steel by their former customers turning rivals, began preparation for the erecting of finishing plants. The situation in the spring of 1901 was exceedingly grave, and a steel war on a clossal scale, with all its ruinous competition and wasteful duplication of plant, was imminent. Matters reached a crisis on the threat of the Carnegie Company to erect a huge tube plant on the shore of Lake Erie near Conneaut. With amazing swiftness, war was averted and the integration movement reached its climax on Apr. 1, 1901, by the organization of the United States Steel Corporation, in which these warring yet interdependent concerns were combined in one enormous completely integrated corporation, with a capitalization of $1,402,846,817; possessing ore deposits estimated to contain about 700,000,000 tons of ore; 50,000 acres of high-grade coal lands; limestone and natural-gas companies; 1,000 miles of railway; steamship companies; blast furnaces and crude-steel works with an annual capacity of 9,400,000 tons of crude steel; and rolling and finishing mills of various descriptions.

Causes of Large-scale Organization.

The causes responsible for large-scale organizations, in general, are well illustrated in the events in the steel industry which culminated in the formation of the United States Steel Corporation. The most powerful driving force is desire to escape ruinous competition. Undoubtedly, the desire to restrict competition was an active factor in the combination movement in the steel

business. All through the 'nineties competition had been extremely keen, and, as was stated at the hearings of the United States Steel Corporation, the 'nineties were strewn with the wrecks of concerns not able to weather the destructive competition which ran riot in that period. Various attempts were made, without much success, to modify this competition through pools and agreements, and it no doubt played an important part in the formations of the earlier consolidations. Previous to 1898, competition was between like concerns—"lateral competition," it might be termed. When, however, the bulk of the steel business had been concentrated into the hands of a dozen giant concerns, and these began to integrate, a vertical competition set in, as we have seen, of a very destructive type. Some idea of the virulence of this competition may be gained by a peep at some of Mr. Carnegie's letters written at this critical period. On Dec. 30, 1898, he wrote his partners, in part, as follows:[2]

In the case of this Tin Plate Company, as in the case of the American Wire Company, if our president steps forward at the right time and informs those people that we do not propose to be injured, on the contrary that we expect to reap great gains from it, that we will observe an "armed neutrality" as long as it is made to our interest to do so, but that we require this arrangement, then specify what is advantageous to us, very advantageous, and he will get it. If they decline to give us what we want then there must be no bluff. We must accept the situation and prove that if it is fight they want here we are "always ready." Here is a historic situation for the managers to study. Richelieu's advice: "First, All means to conciliate; failing that all means to crush." Shakespeare has it: "First in your right hand carry gentle peace; but after peace is gone the worst policy in the world is gentle war."

On July 7, 1900, Mr. Carnegie cabled as follows:

My recent letters predict present state of affairs; urge prompt action essential; crisis has arrived, only one policy open, start at once hoop, rod, wire, and nail mills, no half way about last two. Extend coal and coke roads, announce these; also tubes, not until you furnish staple articles can you get business among them sufficient to keep mines and furnaces in full operation. Never been time when more prompt action

[2] United States of America and U. S. Steel Corp., Brief for United States, p. 270.

essential, indeed absolutely necessary to maintain property. Have no fear of result; victory certain.

On July 11, Andrew Carnegie wrote from Skibo in part as follows:[3]

Confirming my wire upon the situation, let me say that all is coming as expected. There is nothing surprising; a struggle is inevitable and it is a question of the survival of the fittest. For many years we have seen that the manufacturer must sell finished articles. One who attempts to stop half way will be crowded out. Briefly, if I were Czar, I would make no dividends upon common stock, save all surplus and spend it for a hoop and cotton tie mill, for wire mills, for tube mills, for lines of boats upon the lakes, etc.

Had this steel war continued and developed into a relentless struggle between these mammoth concerns, serious losses would have resulted. While, no doubt, a large part of the purpose which inspired the stoppage of hostilities and the getting together of these concerns was to avert the financial losses which would result from the cutthroat competition in lower prices of the product and, also, of steel stocks which were beginning to assume importance on the stock market, there would have followed tremendous losses, from the standpoint of production, from overduplication of properties. As the commissioner of corporations points out in his report, in 1911, on the steel industry:

The active integration movement furthermore presented another very serious consideration. The extensions made by the crude-steel makers into the territory of those manufacturing more finished products, and *vice versa,* meant not only increased competition but also a sudden and great increase in the productive capacity for crude steel and steel products, an increase that might place production, for some time at least, far beyond the country's power of consumption.

Next to the desire to avoid the losses due to destructive competition is the desire for the gains which come from the control of prices through combination. Under competition where no regulation of the supply is possible, there will be fluctuation and falling of prices. This was the condition in the steel busi-

[3] United States of America and U. S. Steel Corp., Statement of case, p. 59.

ness in the 'nineties; prices fluctuated violently, in spite of the efforts of the steel men to regulate them by means of pools and agreements. The dissolution of the rail pool in the early part of 1897, owing to the quarrel between Carnegie and the Illinois Steel Company, brought the price of rails tumbling from $28 on a ton, the average for 1896, to $16.47 and even to $14. Following this the prices of all classes of steel went down below cost. Since the organization of the United States Steel Corporation, prices have been much more stable in the steel business.

Another potent cause of combination is desire for the profits due to stock inflation that occur in the reorganization of combined companies. The large fortunes made by promoters and capitalists almost overnight, out of these combinations, has, no doubt, been a pregnant cause of their coming into being. In the organization of the American Steel and Wire Company of Illinois, in March, 1898, each $100 of the stock of the Consolidated Steel and Wire Company, one of the constituent concerns (and itself a consolidation of seven plants), received $175 of preferred stock and $175 of common stock of the new company, or $350 of new securities for every $100 of old. $11,600,000 of the common stock of the American Steel and Wire Company went to its promoters and underwriters. Similar profits were made on the organization of the other constituent companies of the steel corporation, while in the case of the United States Steel Corporation itself, they were stupendous. Some idea is gained by the enormous profit made by the Underwriting Syndicate, which, in return, for a cash expenditure of $28,000,000 plus its promotion services, received steel stock of an aggregate par value of $130,000,000.

These three causes—restriction of competition, control of prices through combination, and reorganization profits—are all causes influencing the formation of large compound corporations and, by the skeptical, may be considered the only ones. There are, however, certain very real economies in production gained by large-scale organization which we shall treat in the following chapter.

NATURE AND EXTENT OF INDUSTRIAL CONCENTRATION IN THE UNITED STATES

Our study of the forms of business organization and their development has brought to our attention one of the most marked phenomena of modern times, namely, industrial concentration. A study of the evolution of industrial organization in the United States reveals two distinct though related movements in this direction. The first, in point of time, is the increase in size and complexity of the individual plant, commonly referred to as "large-scale production." The second, often confounded with the first, is the increase in size and complexity of the controlling organization, as distinct from any increase in the size of the individual plants which it may control. This second movement, which we have termed "large-scale organization," may start where the former left off, or the two may continue side by side, or one within the other. A third movement, which is really an extension of the second into the realm of finance, is seen in the formation of huge trusts, by "pyramiding," whereby one parent company by means of holding companies is able to exert financial control over a large number of other companies. Though the latter two shade off into each other, the primary object of the last mentioned is financial control rather than economy of operation, and its discussion is beyond the scope of our present inquiry. A brief examination into the extent and present trends of the first two movements is well worth while.

Twentieth Century Shows Limits to Increase in Size of Individual Plants.

The general increase in the size of industrial establishments which marked the development of the factory system in the United States during the latter half of the nineteenth century seems to have reached its climax at the end of the century. This does not mean that there has not been an increase in the size of some plants but that the increase has not been so pronounced or general as to cause the average size to increase, at least so rapidly as hitherto. The facts show that, while in new industries or those which have been slow in adopting modern machinery or mass methods, there has been considerable increase

in the size of plants, in old industries or those not making standardized products capable of being made in large quantities by machinery, the average size of plants has remained stationary or even decreased. An exhaustive investigation into industrial concentration based on U. S. Census statistics has been recently made by Willard L. Thorp, whose conclusions on this phase of the matter will bear quoting:

> That there is, in general, some trend toward larger establishments must be expected, for new industries are growing rapidly which require large establishments for profitable operation, such as automobile, rubber-tire, beet sugar, and electrical-apparatus enterprises. Since these and other industries are expanding at a more rapid rate than the older industries they naturally tend to raise the general average for industry as a whole; but the census data certainly cannot be used to support the hypothesis that the tendency for industrial establishments since 1900 has been, in general, to increase in size. The rapid concentration, so evident in the nineteenth century, is by no means so marked in the twentieth.[4]

As a result of an analysis into special industries, he states:

> Certain industries—those manufacturing salt, beet-sugar, leather, woolen goods, automobiles, iron and steel, and coke—have shown notable increases in average size of establishments. Other industries, such as slaughtering and meat packing, artificial ice, cotton goods, boot and shoe manufacture, have maintained a more constant level in size of establishments, and the silk, lumber, carriage and wagon, and shipbuilding industries have recorded tendencies to decrease in average size of establishments.

It would seem to be obvious that there is a limit to the size to which an industrial plant can grow and still be efficient. There is, no doubt, a most efficient size for each type of plant and no doubt, either, that some plants have exceeded that size and become unwieldy in consequence. Not only is the size of the individual plant conditioned by the limits inherent in the very economies that, in the first place, brought about large-scale production, but, also, certain other factors, such as the develop-

[4] Thorp, W. L., "The Integration of Industrial Operation," *Census Monographs* III, p. 45.

ment and distribution of electrical power, which make it available to small units scattered through the rural districts, and the increased cost of marketing in inverse ratio to the massing of manufacturing, have tended in recent years to counteract the tendency to large-scale production.

Central-office Organizations.

The second movement, consisting of an expansion of the organization of control rather than of the physical unit of production, is not subject to, or so subject to, the limitations just mentioned. Large-scale organization permits the operation of several plants under a unified control, which may be large or small, situated in one place or scattered over a wide area. This is brought out by Mr. Thorp in his investigation into the distribution of central-office organizations in the United States. A central-office organization, according to the census definition, is an organization which operates, from a single central office, enterprises in more than one industry or locality or more than one plant within a locality or industry, provided these are sufficiently separate entities and simple industrial combinations or large-scale organizations. Mr. Thorp selected 792 central-office combinations in different industries, operating 2,776 establishments, in order to determine the distance of the separate plants from the central offices. The selection was made from the smaller central-office organizations and, therefore, does not by any means exaggerate the typical distribution. One-half of these establishments are within a 25-mile radius of their central offices; the other half are scattered over distances ranging up to 2,880 miles from their centers of control. The "span" of the groups was also measured, that is, the distance between the separate plants. More than one-half have spans of more than 100 miles; the average is 272.89 miles. More than one-fourth of the central offices operate establishments which are more than 250 miles apart, while, in 46 cases, covering 35 industries, the plants operated were more than 1,000 miles apart. The greatest span was that of a plant engaged in fish canning and preserving, which operated an establishment in Eastport, Me., and that of another in East San Pedro, Cailf., a distance of 2,880 miles. Since the central office was also in East-

TABLE IV.—CENTRAL OFFICES, BY GENERAL GROUPS OF INDUSTRIES, 1919 *

General group of industry	Central offices		Establishments	
	Number	Percentage distribution	Number	Percentage distribution
All industries	5,838	100.0	21,464	100.0
1. Food and kindred products	1,094	18.7	4,544	81.2
2. Textiles and their products	923	15.8	2,832	13.2
3. Iron and steel and their products	466	8.0	1,602	7.5
4. Lumber and its remanufactures	943	16.0	2,829	13.2
5. Leather and its finished products	145	2.5	495	2.3
6. Paper and printing	273	4.7	918	4.3
7. Liquors and beverages	87	1.5	268	1.2
8. Chemicals and allied products	729	10.8	2,400	11.2
9. Stone, clay, and glass products	434	7.4	1,100	5.1
10. Metals and metal products other than iron and steel	119	2.0	445	2.1
11. Tobacco manufactures	117	2.0	553	2.5
12. Vehicles for land transportation	65	1.1	287	1.3
13. Railroad-repair shops	187	3.2	1,850	8.6
14. Miscellaneous industries	357	6.1	1,362	6.3

* THORP, W. L., "The Integration of Industrial Operation," *Census Monographs* III.

port, this group reported the greatest distance from central office to establishment.

The census figures do not take into consideration the number of separate establishments owned and controlled by these firms in foreign countries. Yet a large number of corporations in the United States are operating enterprises engaged in the extraction of raw materials or manufacturing in foreign nations all over the world. The Hershey Chocolate Company, in order to obtain raw materials, has expanded into Cuba, where it operates two sugar mills, 69 square miles of sugar plantations, and the railroads necessary for efficient transportation. The rubber companies own extensive plantations abroad. The United States

Rubber Company, through its subsidiary company the United States Rubber Plantation, Inc., is said to own 93,000 acres of land in Sumatra, of which 44,227 acres have been cleared and planted with over 5,000,000 rubber trees. The oil companies own and operate oil mines in Mexico and elsewhere. The International Paper Company operates plants in Maine, New Hampshire, Vermont, Massachusetts, and New York, while the greater part of the woodland which it controls is in Canada. This one company alone has the Canadian government's license to cut timber on about 2,797,760 acres of woodland in Quebec and New Brunswick. A large number of firms are engaged in manufacturing in foreign countries. The Singer Manufacturing Company operates plants in St. Johns, Quebec; Kilbowie near Glasgow, Scotland; Wittenburg, Prussia; and Podolski, Russia. The Goodrich Rubber Company, the Standard Oil Company, the International Harvester Company, the Ford Motor Company, the American Radiator Company are typical of numerous other American corporations which own and control enterprises scattered all over the globe. These instances illustrate the far-flung control of American business enterprise. The development of the corporation form of organizations and modern methods of communication are tending to eliminate distance in the control and operation of idustrial enterprises.

In 1900, the Census Bureau, in its examination of industrial combinations, found 2,040 concerns constituting about 1 per cent of the total number recorded by the census. Though these represented but 1 per cent of the entire number of establishments, they employed 8 per cent of all wage earners and produced 14.1 of all products. This is the only study made by the Census Bureau into industrial combinations. Mr. Thorp's investigation shows that in 1919 there were 5,838 central-office organizations operating 21,464 manufacturing establishments, and 534 were also active in mining. Excluding automobile-repair shops, these constituted 7.8 per cent of the total number of manufacturing establishments reported in 1919. The percentage of total number of establishments does not, however, give a true indication of the importance of central-office groups, as they are, in general, establishments above the average size, both in number of wage earners and in value of products. It is probable that

more than one-third of all wage earners are employed in this group and that it produces a similar proportion of the total product of all American factories.

These combinations are not confined to any particular industry or group of industries but are distributed pretty generally through our whole industrial system, as is shown in Table IV, p. 130. They vary in size from huge combinations operating 100 establishments with enterprises in foreign countries to smaller concerns with but 2 establishments. In certain industries, such as the stone, clay, and glass-products group, a limit seems to be set to their size. In others, such as food, chemicals, and vehicles for land transportation, the tendency is for larger combinations to exist.

One of the most significant facts brought out by this investigation is that industrial combination is largely based on functions. These combinations have not come about by chance but mainly because the establishments combined are performing similar or related functions or processes. The different functional groups and the number of concerns in each group are shown as follows:

Uniform products	3,029
Joint products	427
By-products	125
Dissimilar products of similar processes	154
Complementary products	159
Auxiliary products	169
Dissimilar products for same market	233
Successive products	903
Unrelated products	47

The table shows that 3,029 industrial combinations consist of concerns in which the separate establishments combined are engaged in performing similar functions and in making similar products. This is horizontal combination. About 62 per cent of industrial combinations are of this simple type. Of the 4,803 central-office groups included in this functional classification, 903, or 18 per cent, include establishments whose functions are successive, working toward the completing of a final product. This is vertical combination, or integration. If the horizontal group is eliminated, then the vertical-combination group constitutes 50 per cent of the remaining complex functional groups.

It is the most prevalent of the complex forms of organization. The reasons for the combinations of concerns making unrelated products are various and interesting. The vice president of a large cotton-manufacturing concern states:

> We are operating eight separate mill plants. Our largest operations are at ——. This town is entirely one of mill workers, incorporated, and a municipality to itself. The company has found it to its advantage to organize and run in the interest of a better community a dairy farm, a chicken farm, an ice plant, a laundry, a grist mill, a drug store, a meat market, a hospital, and a swimming pool.
>
> We have found that these side lines, managed economically and in a business-like way by our organization, provide conveniences for our operatives which they otherwise could not have in the country districts.

Inventions outside the original field of activity of the concern account for some combinations. In one case, perfection by the government of the Liberty airplane motor necessitated an improved spark plug. It was suggested to one of the large jewelry concerns, which had demonstrated its eagerness to assist, that it undertake the problem. As a result, the jewelry company has built up a considerable business, separately incorporated, manufacturing spark plugs.

The very able and valuable statistical analysis of industrial combinations prepared by W. L. Thorp for the Census Bureau has given us an insight into the nature and extent of this important movement that has not been hitherto possible. His conclusion of the whole matter is very moderately expressed:

> The direction in which modern industry is tending cannot be definitely determined, but it is probably true that the first part of the twentieth century has seen far greater development of concentration in terms of combinations of superstruction, either operating or financial combinations, than it has seen development of the scale of production within single establishments.

Whether this trend has reached its zenith or not would be hard to say. The events of the last few years would not lead us to believe that there has been any appreciable diminution of the movement. We seem to be right in its midst. That it has its limits, of course, is certain. One often given is the scarcity of men able to administer such huge affairs. That men of such

caliber are scarce it is true. The development of the science and art of organization itself has simplified the work of management, however. Accounting systems, systems of control, master reports showing at a glance the status of the vital factors of the enterprise, the telescoping of organizations, each sufficient to itself, leaving only the larger policies and matters of emergency to those at the top, all form a wonderful mechanism facilitating control by one central directing force.

Summary.

The trend of development in the field of business organization has been in the direction of larger and more complex forms of organization. The simple corporation has evolved into the large compound corporation in the form of the holding company or the merger. The process of combination by means of which these huge organizations have come into being has proceeded along two different lines, termed "horizontal" and "vertical." Horizontal combination, historically the earlier movement, consists of unions of concerns making the same kind of products. In vertical combination, establishments operating in different stages of an industry are linked together in one unified organization, which controls all the essential activities from the extraction of the raw materials to the marketing of the finished product. The series of combinations that occurred in the steel industry leading up to the formation of the United States Steel Corporation furnish an excellent example of industrial combination. The four motives responsible for this development, are (1) desire to escape ruinous competition; (2) desire to secure monopoly power over price; (3) desire for the profits of promotion and reorganization; (4) desire to gain the economies of large-scale organization.

Our study of industrial organization has brought to light two distinct trends. The first in point of time is the increase in the size and complexity of the individual plant, commonly referred to as "large-scale production." The second, termed "large-scale organization," involves an increase in the size and complexity of the mechanism of control or the superstructure of industry rather than of the physical unit of operation. Census statistics seem to indicate that large-scale production reached its climax at the beginning of this century and that while there has been

since 1900 some trend toward larger establishments in certain industries, the rapid concentration so evident in the nineteenth century is by no means so evident in the twentieth.

On the other hand, the trend toward large-scale organization has been increasingly evident in recent years. The recent statistical investigation of W. L. Thorp brings out some interesting facts concerning the nature and extent of industrial combination. In 1919, there were 5,858 central-office organizations operating 21,464 manufacturing plants. Though these constituted but 7 per cent of all manufacturing concerns, it is estimated that they employed a third of all wage earners and produced a similar proportion of the total production of American factories. These concerns varied in size from small organizations operating but 2 plants to huge combinations controlling 100 establishments. One-half of the plants were within a radius of 25 miles of their central offices, the other half were scattered over distances ranging up to 2,880 miles. The far-flung control of American enterprise is also evidenced by the increasing number of American-owned plants in foreign countries. About 62 per cent of the industrial combinations studied were of the horizontal type, and 18 per cent were vertical combinations.

Test Questions

1. What is the difference between a holding company and a merger?
2. What is meant by vertical combination? By horizontal combination?
3. Outline the events in the steel industry leading up to the formation of the United States Steel Corporation.
4. State the four chief causes of combination.
5. In what industries have the tendencies toward combination been most marked during the last ten years?
6. What industries will be likely to pass through these stages of combination in the next ten years?

CHAPTER X

THE ECONOMIES OF LARGE-SCALE ORGANIZATION

General Statement as to Economies.

By a large number of people the economies of large-scale organization are regarded as mere pretexts invented by big business to camouflage its real motives, namely, the largest possible profits. And there is, without doubt, basis for this opinion. There have been many cases of large combinations formed primarily for promotion profits and a monopolistic control of price, in the prospectuses of which the economies of combination have played the part of decoy ducks to lure the general investor and to attract the attention of the public away from the real facts. A careful study of monopoly prices during the last twenty-seven years shows that the large profits gained in many cases are not fully accounted for by higher prices. In many instances, the price has been increased but little and, in some cases, not at all, as with steel up to the time of the war, and yet despite this fact, huge profits have been made, sufficient to pay dividends on millions of watered stock and put other millions (about $450,000,000 in the case of the United States Steel Corporation) out of earnings into improved plant and equipment. Now, if these extravagant profits have been secured with, or without, but a small increase in price, they must have issued largely from the economies of combination. Largely increased profits with, we will say, a slight increase in price strongly point to the existence of some bona fide advantages in large-scale organization. There seems scarcely a doubt but that costs have been lowered; the wonder is that prices have not been reduced in some measure, also. A study of the nature of these organizations would lead us to the conclusion that, in many respects, they possess advantages over small competing concerns, and this conclusion is well reinforced by the experience of practical men connected with their operation. These advantages will, of course, apply differ-

ently in different industries, and their extent will vary according to the nature of the industry.

Purchasing.

In the buying of materials and supplies, the large concern usually has an advantage over the small by buying in larger quantities at a lower price. This is well illustrated in the retail field by such organizations as the large five and ten cent stores, the chain stores, and the large mail-order houses, which owe a good measure of their success to their superior purchasing abilities.

Not only is there a saving by buying in large quantities at a lower price, but also, by concentrating the buying in one department, under one head buyer, greater efficiency is obtained than when each concern had its own separate purchasing department. Mr. Pope, vice president of the American Bicycle Company, in his affidavit to the Industrial Commission stated, that as a result of consolidation:

> . . . buying is concentrated in the hands of one officer and his assistants and this saves energy and expense; a smaller aggregate quantity of supplies was carried than before, and thus interest, insurance, storage, and shop charges had been reduced.

Expensive and Highly Specialized Machinery.

Many a small concern is handicapped owing to its inability to obtain or use the most efficient machinery in its line. This is not necessarily due to lack of capital but oftentimes to insufficient output. Machinery and large-scale production have grown up side by side, and the one is necessary to the other. Specialized machinery is possible only with quantity production. It would be an utter impossibility for an automobile plant turning out but a few cars yearly to develop the highly specialized machinery for which the Ford plant is particularly famous.

Perhaps the most striking example of an industry whose marvelous growth has sprung from the development of huge and highly specialized machines is the steel industry. But this growth would have been impossible without the development, also, of huge organizations capable of purchasing and utilizing this machinery.

More Efficient Use of Plant and Equipment.

A common occurrence following the consolidation of a number of competing plants into one centralized organization has been the closing down of the weaker and the concentration of production in the more efficient. In the case of the whisky trust, to cite a rather trite example, out of the 81 plants acquired all were shut down but 10 or 12. In the period of competition preceding this consolidation, more plants had sprung up than were necessary to fill the demand. By concentrating production in the most efficient plants and running those on full time, costs were cut way down. John W. Gates when asked why, after the organization of the American Steel and Wire Company, they had closed some of the plants said, "We have closed all of the plants that could not operate economically and increased those that could." When questioned as to the defects of the closed plants he stated that "Sometimes it was one of location and sometimes it was badly constructed machinery and sometimes it was a combination of both." Mr. Havemeyer also stated in evidence before the Industrial Commission:

> . . . that the greatest advantage of the sugar combination is in working the refinery full and uninterruptedly. By buying up all the refineries, burning them up, and concentrating the melting in four refineries and working them full, you work at a minimum cost.

It should be noted here that the ability of the combination to make this saving is due to the condition of overproduction and duplication of plants which has arisen under the preceding period of competition and that this saving is effected in two ways: first, by utilizing the most efficient plants; second, by running those plants at full capacity.

Plant Specialization.

A further advantage arising out of a centralized control of plants lies in the ability of the management to extend the principle of specialization to individual plants. Instead of each plant manufacturing several different sizes or varieties of products, by limiting it to one or two standard articles for which it is especially adapted, the costs of production may be materially cut. As that practical steel man, Charles Schwab, once said:

You can get a greater output and a cheaper output from a mill by running that mill continually on one product. If we have two mills each of which is run on a specific product, one can be run on one, and the other on the other product, and thus get out a greater tonnage and do it at a much lesser cost.

STANDARDIZING THE BEST METHODS OF MANUFACTURE

One undoubted superiority of the combination over disconnected competing plants lies in the opportunity which it affords for the exchange of information and the selection of the best processes of procedure followed by any of the plants and their adoption in all. Judge Gary, in testifying to the economies achieved by the organization of the Federal Steel Company, said, some years ago:

I do not care what plant one goes into there are beneficial features in that plant that are not in other plants. In talking with any expert, information is received that will be beneficial if given to an official perhaps very remotely located, and of course the effort is to utilize to the best advantage everything that is a benefit in any particular plant.

In the last few years, tremendous savings have been made by the United States Steel Corporation through its whole-hearted adoption of this policy. Mr. Lapham, vice president of the United States Leather Company, also testifies to the advantages of this principle in the leather combine by stating that "the chief saving effected by the consolidation has been the introduction of the best methods in all of the tanneries." This exchange of ideas, practices, and knowledge made possible by cooperation and combination is of incalculable benefit to any industry. To a limited extent, it is possible under cooperative competition, but its benefits are more fully realized when production is controlled by one centralized organization.

Integration.

Still further economies are gained when the combination is not merely lateral but vertical, linking up under a unified control the consecutive stages in the production of one commodity.

In the first place, there is a nicer adjustment of demand and

supply between these various stages of production. The producers of the raw material depend for their demand on the manufacturers who, in turn, rely on the raw-material men for their supply. It often occurs, when these stages are carried on by separate interests, that the manufacturers are unable to secure a sufficient supply of the proper quality at the time they need it, and as often those in the raw-material end find themselves with an oversupply on hand. If, then, these interdependent concerns operating at different stages along the channel of production are directed by a central intelligence equipped with accurate information of the requirements of each, much of the loss through delays will be prevented and the stream of production will flow more evenly along its course.

Not only does integration make possible a better regulation of interproductional demand and supply, but it also secures great economies in manufacturing by permitting a correlation of processes, which if carried on separately would result in waste. In the steel industry this is particularly evident. Should the blast furnaces be run independently of the bessemers and open hearths, and these, in turn, be run separately from the rolling mills, inconceivable wastes would follow. The contrast presented by Mr. Roberts' picture of the disjointed methods of steel making in the 'seventies with the smooth-running continuity of production in a modern steel plant makes clear to the veriest layman the tremendous savings secured through placing under a central control all of the processes of steel making.

Division of Labor.

Large-scale organization, whether in the form of a single large plant or a combination of plants, permits a greater degree of division of labor. We have already discussed the advantages of this principle and its dependence on large-scale production. It will suffice to call attention to one aspect of labor specialization, that has been brought to the front during recent years by our large industrial combinations, namely, the advantages derived by its application to the higher orders of ability. This is brought out in a very practical way by a statement of Mr. Schwab in reference to the advantages of the United States Steel Corporation:

The steel-making industry is peculiar in this, that no matter how small the operations are there are certain skilled men in each line necessary. If a firm has two furnaces or fifty-two, they can't do without our skilled man in each of their lines, as a skilled melter, skilled superintendent, skilled chemist, skilled draftsman, and so on down the line. Now we can consolidate all these industries, we can have one selling man, for example, one chief chemist, one chief engineer, that will answer all purposes, for all these works, by adopting the same methods at each of their works.

In short, large-scale organization permits a more profitable employment of high-priced and highly specialized men, precisely as it does in the case of machinery.

Comparative Cost Accounting.

It is often urged against the large combination that it loses the stimulus that comes from competition; that it lacks the incentive to cut costs or improve processes. But judging by the experience of some of the large combinations, this does not seem to be an inherent lack of large-scale organization. In fact, it has been found possible, in some cases, by standardizing systems of accounting, to inject an even keener kind of competition into the operating plants and reduce costs below their level under previous competition. The old Carnegie Company was the pioneer in this practice; and the Steel Corporation, through its monthly comparative-cost statements prepared by its statistical bureaus, copies of which are sent to the operating heads of each company, has been eminently successful in increasing output and cutting costs. To cite one instance from the experience of this corporation: As a result of sending to each blast-furnace manager once a month the costs of each of the various blast furnaces, putting the most economical at the top and the least at the bottom, with the name of the manager and the conditions, they obtained a saving in the first year of approximately $4,000,000 in that department alone. By means of comparative costs, it has been found possible not only to fan the flame of competition and pit, department against department and plant against plant, but also to locate the causes of inefficiency of the high-cost plants and raise them to the level of the more efficient. By this means, large-scale organization retains the benefits of

competition and, in addition, secures the advantage of constructive cooperation.

Sales Efficiency.

It is often said that production within the plant has been pretty well systematized but that the place for improvement is in getting the product from the plant to the consumer; here is where the waste lies. There seems little room for doubt that the cost of selling many commodities is outrageously high and that if the price of commodities is to be lowered to the consumer the point of attack should be the distributing end of production. Here, again, large-scale organization seems to offer some help.

A common occurrence following the formation of combines has been the disposal of many of the salesmen. The Whisky Trust were able to get along with 300 less; the American Steel and Wire Company dispensed with 200; and so on. Here the salesman, instead of the mechanic, is a victim of a labor-saving device, not this time an invention of iron or steel but an improvement in the machinery of organization. Where, before, five concerns each sent a man over the same territory, now one is able to handle the business at almost a fifth of the expense. There is, of course, a limit to the number of salesmen of whom it is wise to dispose. But the chief saving is not by any means in the reduction of salesmen; when a number of competing companies, each of which previously maintained a separate sales office and organization, unite and form one centralized sales office under the direction of a picked sales manager, the cost in officers' salaries, rents, clerical hire, and so on, is much reduced, and the selling activities better directed and coordinated with production. There are cases where it is not wise to dispose of local officers, but even so, considerable cooperation is feasible, and overlapping of territory avoided.

The large combination also possesses advantages in selling in foreign markets. The Standard Oil Company of New Jersey, the International Harvester Company, the Steel Corporation, and others have succeeded in securing a world-wide distribution of products such as would have been beyond the power of small concerns. The Webb bill permitting combinations of competitors in foreign trade is a recognition of this fact.

In the matter of advertising, the combination seems to possess some advantage. When a number of competing concerns are united, the waste due to competitive advertising can be eliminated. The number of brands may be reduced by standardization. Instead of each concern carrying on its own advertising, the whole of it may be concentrated under one control and a better distribution of the advertising obtained at a lower unit cost. Some saving, no doubt, is obtained by advertising a number of related products under one brand, as the Armour people with their oval label and the DuPont Company, the National Biscuit Company, and numerous others, each of which has a whole family of products advertised under the family name.

Delivery.

Most of the big combinations, by the elimination of cross-freights, claim considerable savings in the cost of delivery of their finished products. The orders received by the combination are distributed to the most conveniently located plants, so that the consumer in the Chicago district receives his goods from the Chicago plant, while the orders from the East are filled from the Philadelphia plant, thus making a considerable saving in freight charges over what would be necessary were the plants under separate management. Not only is the large national organization, by its geographical distribution of plants, able to deliver more directly to the consumer, but also the same savings are open to local industries. In the retail field there is a great opportunity for the reduction of delivery costs. Six laundry or grocery wagons go up one street where, perhaps, two could do the work. It would, of course, be a gigantic task to eliminate the waste efforts of competitive deliveries of grocers, bakers, etc., in any big city, but a large retail combination should be able to deliver at a lower cost than if each of the stores maintained its own delivery system.

By-products and Research.

One of the most interesting features of industrial progress of recent years has been the remarkable manner in which industry, with the magic wand of science, has changed its wastes into useful products. Slag heaps have been transformed into concrete bridges and buildings; out of the offal of the slaughter

house have come all sorts of things from violin strings to rare medicines; even the smoke from the furnace has been arrested in midair and made to yield dyes, perfumes, and powerful explosives. Millions have been saved which were before lost. The United States Steel Corporation is saving between 1,700,000 and 1,800,000 tons of coal a year by the use of blast-furnace gases and gas from coke ovens and is manufacturing annually, from blast-furnace slag previously wasted, over 10,500,000 tons of cement. It should be borne in mind that this by-product development is itself a by-product of large-scale production. The large plant makes possible a utilization of materials that in a small concern would be wasted.

Closely related with by-product saving is the experimental and research work carried on by the big organizations. The object is to improve the product or service to the consumer, to find new uses for the commodity or more economical methods of manufacture. These research departments are often conducted along broad lines and are by no means entirely commercialized. Scientists of various descriptions, chemists, physicists, engineers are employed and allowed to "carry on" pretty much as they please, indulging, in many cases, in almost pure scientific research. Experimental research of this nature is beyond the reach of the small concern and seems further to discount the argument that big business lacks the spur to progress furnished by competition. A trip through the laboratories of some of the large organizations, such as the Eastman Kodak Company, the Edison Company, the General Electric Company, the Curtis Publishing Company, the American Telephone and Telegraph Company, and numerous others, and especially a chat with their occupants, would be an enlightenment to those who believe that large-scale organization by its very nature puts a damper on the fires of progress.

Economy in Management.

Finally, in the field of management itself, the combination possesses advantages. Under competition, each concern had its own president and officers; after combination, it has been found feasible to reduce the number of these expensive executives and yet run the concerns efficiently. The American Steel and Wire

Company at its organization dispensed with 50 per cent of the high-priced executives of the constituent plants by putting the operating end of the business in charge of officers in New York and Chicago. There is, of course, a limit to this economy as to all others, but, as a general principle, a more effective employment of managerial ability and a saving in the cost of management result from a centralization of organization.

Economies in Financial Administration.

Large-scale organization also affords certain advantages in the financing of enterprises. Loans can be secured at a lower rate as a result both of larger issues of bonds and of better security. Risk is also lessened because of the pooling of profits and losses, the greater ability to study wider market conditions, and the more able administration. Greater financial resources are available in times of depression or business strain.

Conclusion.

The above list by no means exhausts the economies of large-scale organization but presents a brief discussion of the major ones. It should be noted that these include not merely the advantages due to quantity production or size of plant, such as are sometimes referred to under the term "large-scale production," but take in those economies which proceed from the modern development in the field or organization which has been termed "large-scale organization." The advantage of the big combination or the large compound corporation over a number of separate competing concerns lies in the fact that it furnishes a form of organization permitting a fuller expression of the principles of organization. It secures a greater degree of centralization of control, of specialization, of unity of purpose.

During the last few years, large-scale organization has been rightly scrutinized and criticized. The radical element in the nation, however, has at times jumped to the conclusion that because some combinations have been guilty of malpractices, all are bad and should be destroyed; and much legislation has acted on this principle. An impartial analysis of their advantages simply as producers is, therefore, not out of place. If many of the commodities consumed by the public can be produced

through these organizations more cheaply than ever before, if they increase the production capacity of the nation and render it more efficient in international competition, to destroy them would be shortsighted, especially if some effective regulation of them in the public interest can be secured.

Test Questions

1. Name twelve economies of large-scale organization.
2. What is the distinction between "large-scale production" and "large-scale organization"?
3. What advantages has a combination over a number of separate competing companies in the matter of sales efficiency?
4. How has large-scale organization encouraged the utilization of by-products?
5. How can competition be secured within a large combination?
6. Do facts justify the statement that "trusts" tend to arrest the improvement of the products which they control?

References

BLOOMFIELD, M., "Management and Men."
BURGLAND, A., "The United States Steel Corporation," *ibid.*, Vol. XXVII, 1907.
CARVER, T. N., "Principles of Political Economy."
CLAY, H., "Economics for the General Reader," Chaps. III–VIII.
DURAND, E. D., "The Trust Problem."
EDIE, L. D., "Principles of the New Economics," Chap. VIII.
ELY, R. T., "Outlines of Economics," Chap. XIII.
GIDE, C., "Political Economy," Part II, Chap. I.
HANEY, L. H., "Business Organization and Combination."
JENKS, J. W., "The Trust Problem."
JONES, E., "The Trust Problem of the United States."
KIMBALL, D. S., "Principles of Industrial Organization."
MACGREGOR, D. H., "Industrial Combinations."
MACROSTY, H. W., "The Trust Movement in British Industry."
MARSHALL, A., "Industry and Trade; Principles of Economics," Book IV, Chaps. VIII–XII.
MARSHALL and LYON, "Our Economic Organization."
MOODY, J., "The Truth about the Trusts."
MONTAGUE, G. H., "The Rise and Fall of the Standard Oil Company."
NICHOLSON, J. S., "Political Economy," Chap. VIII.
RIPLEY, W. Z., Ed., "Trusts, Pools and Corporations."
STEVENS, W. S., "Industrial Combinations and Trusts."

TARBELL, IDA, "History of the Standard Oil Company."
TAUSSIG, F. W., "Principles of Economics," Chap. 63.
VAN HISE, C. R., "Concentration and Control."
WILSON, W., "The New Freedom."
Bureau of Corporations reports on the beef, petroleum, tobacco, and steel industries.
United States Industrial Commission *Report* I, II, XVIII, XIX.

PART III
EXCHANGE, VALUES, AND PRICES

CHAPTER XI

ORIGIN AND NATURE OF VALUE

DIVISION OF LABOR RESULTS IN EXCHANGE, AND OUT OF EXCHANGE SPRINGS VALUE

In any system of industry based on private enterprise, exchange is the necessary sequence of division of labor. It is evident that if each individual is to devote himself to the production of one commodity, there must follow an exchange of products. In a primitive community devoid of division of labor and exchange, there was no separation of individuals into producers or consumers. The moment that two individuals exchange their products, the producer and the consumer appear as separate individuals, each party to the exchange is producer to the other, and each is consumer to the other. As each naturally wishes to make a favorable exchange, a division of interests occurs; the question comes up of the amount of one's product which one will exchange for a certain quantity of the other's, and thus the problem of value appears.

Exchange, Value, and Distribution.

In a primitive society where each individual was self-sufficient, producing only that which he consumed and consuming only that which he produced, there would be no labor troubles or industrial unrest. No one could feel that he was not receiving a square deal or that he was not getting as much as he was worth; each would be receiving exactly what he produced; the amount he consumed would depend directly on the amount he produced. Just as soon as exchange arises, the producer ceases to produce directly what he consumes. The amount of commodities which he enjoys as a consumer is determined by the amount of the products of others which his own product will command in exchange, on the exchange value of his product.

If, instead of bartering his product directly for the products of others, he sells them in the market, and with the money received buys consumption goods, the case remains the same except that he has exchanged his product for that of others through the medium of money. The amount of goods he will obtain as a consumer will depend on two exchanges: first, on the sum of money he receives in exchange for his product, and, second, on the amount of commodities his money will exchange for on the market.

With the development of division of labor and the extension of the market with all its intricate machinery for facilitating exchange, most products pass through the hands of several producers before reaching the consumer. If it be a production good, as iron or steel, it may never reach any so-called "ultimate consumer" but will aid in the production of some consumption good or service. Even if it be a consumption good, such as shoes in the hands of a manufacturer, it will usually circulate through the wholesaler and retailer before it finds the consumer. This process of exchange is further complicated by the fact that one individual does not produce a whole product, but several cooperate through some form of business organization. Out of the money price for which the product is sold on the market, each receives a share in exchange for the part he has played in its production. The owners of land receive theirs in the form of rent, the owners of capital in interest, the workers in wages, and the owners of the organization in profits. These money shares they exchange in the market for commodities produced by others in a similar manner. In this case, instead of each exchanging his products, he exchanges his services, and the amount of goods which he will have at his disposal as a consumer will depend on the exchange value of the services which he renders in production.

In our present economic system, we do not produce directly the commodities we consume but secure them through a roundabout process of exchange in return for the part which we play in production. In reality, the world is a market, and we are the buyers and sellers. We enter it first as sellers of our products or services and later as buyers of the things that make life worthwhile. The amount of money which we as buyers have to spend

depends on the amount which we as sellers have been able to obtain for our services or products. It is in the factory under the laws that govern efficiency that commodities are produced. But it is in the market under the laws that govern value that they are distributed. From the time we leave school till we totter toward the grave, the great majority of us are selling either service or products. On the value of these depends our share of the things that make life worth living. As buyers and as sellers we are equally interested in the forces that determine the values of things. No subject so closely affects our well-being.

The Difference between Utility and Value.

In our discussion of production, we were concerned with utility; the moment that we introduce the subject of exchange we begin to speak of value. The problem of production is the creation of utilities in economic goods; that of exchange, we say, is the determination of the value of those goods. First, let us distinguish clearly the difference between the terms "utility" and "value," as they are used in economics. Utility we have defined as the power which a commodity possesses of satisfying a want. In general parlance, the word value is often used to express what in economics is termed utility. The economist says that fresh air under ordinary conditions has no value. The man in the street answers back that of course air has value; and the argument waxes hot. Now, as James would say, "You are both right and both wrong; it all depends on what you practically mean by the term value." If by value is meant want-satisfying power, fresh air certainly has value; if by value is meant the power to command other things in exchange, then fresh air under ordinary conditions has no value, for who in his right senses would pay anything for a cubic foot of air? In economics, the term value is used to express the power which a good has to command other goods in exchange for itself.

Utility and value, then, are two different powers. It is a familiar fact that many things, as water in the lakes, sunshine, and fine scenery, satisfy wants yet have no power to command anything in return. They are free goods, possessing utility but no value. The various commodities and services which are the objects of business transactions not only satisfy wants but also

possess the power of exacting a payment for this satisfaction. In addition to mere utility, they possess value—the power of commanding other things in exchange for themselves.

Utility an Element of Value.

Though utility and value are different, they are intimately related. Free goods possess utility but not value; all goods, however, having value possess utility. It is evident that no one will give anything for something which he does not want. Utility, then, is, of necessity, an ever present element of value. Is there any other universal element in value? As both free and economic goods have utility, to what do economic goods owe their value?

How Value Originates.

For the sake of illustration, let us suppose that some outdoor-loving American, lured, perhaps, by aggressive Canadian advertising, is spending his vacation canoeing on one of Ontario's wild and beautiful lakes. Since it is a hot summer day, he is thirsty and so dips his cup in the lake or, better still, in camping vernacular, "shoots the bottle," that is, he lowers a stoppered bottle weighted with a stone to the bottom of the lake, jerks out the stopper, and draws up a bottle of cool water to quench his thirst. Let us suppose, again, that a traveler on the Sahara Desert with only a meager supply of water left in his canteen, which he has been hoarding with jealous care, arrives at an oasis owned by an Arab sheik and bargains for a supply of fresh water. In both cases, the commodity quenches thirst and has utility; in the second case, it possesses, also, value. What is the cause of the value of the water in the second case? The illustrations suggest the answer: scarcity. Though scarcity is often obscured by other causes more apparent, it is a fundamental cause of values everywhere, and it is worth our while to see just how it gives rise to value.

Let us notice why water under the conditions of supply given in the first case has no value. No matter how thirsty is our canoeist, there is more water in the lake than he can drink. So that if a cupful is taken away, no want will go unsatisfied owing to its removal. Nor if a cup is added to his supply will any

want be satisfied which otherwise would have remained unsatisfied. None of his wants depends on any unit of the supply for its satisfaction, and no unit is essential to the satisfaction of any of his wants. If, therefore, a cup is added he gains nothing, and if a cup is taken he loses nothing. As long as he has more water than he wants, a cup more or less is a matter of complete indifference to him. And although if he is thirsty he will drink it with as much gusto as the finest champagne, he would pay not a cent for it.

On the Sahara, the conditions are reversed; the traveler, instead of having more than he wants, wants more than he has. If he should spill a cup on the desert sand, a want would remain which otherwise would have been satisfied. A cup added to his supply means a want filled which without the cup would have to go unsatisfied. A want now depends on each unit of his supply, and each cupful possesses an importance as the means to the satisfaction of some want. If a cup is taken away, he loses a satisfaction; if one is added, he gains. Water thus becomes an object of economy; rather than suffer thirst he will be willing to pay for a cup of it.

Utility and Scarcity.

Hence, it follows that whenever the supply of a good is in excess of wants for it, units of that good will have no value and the good becomes free. Just as soon as the supply of a good is less than the wants for it, units of that good become objects of economy and possess value. Economic goods are thus defined as those goods the supply of which is less than the demand for them. Value, then, is born of a union of utility and scarcity. Neither one of these alone gives rise to value, for however useful a commodity is, its supply must be limited to have value; and however scarce a commodity is, it must be wanted to possess value. In all values everywhere, these two elements are always present. They are the two universal causes of the values of economic goods.

The Relation of Labor to Value.

While the exchange value of economic goods springs from a union of utility and scarcity, there are many other subordinate

causes that help to determine values, all of which operate through these two fundamental ones and sometimes obscure them. One of the most important of these is labor. So important is it, that it has been regarded by some as the sole element and determinant of value. This view has resulted in the famous labor theory of value, espoused by no lesser lights than Adam Smith, Ricardo, and especially by Karl Marx. Ricardo regarded labor "as being the foundation of all value and the relative quantity of labor as almost exclusively determining the relative value of commodities." Karl Marx states that "the value of a commodity is determined by the quantity of labor expended during its production." While we are yet not quite prepared to discuss what does determine the relative amounts of exchange values of commodities, we will stop to notice that labor cannot be the sole determinant.

Though the values of things, in general, may correspond roughly to the quantity of labor expended on them, such is by no means always or necessarily the case. In the first place, once a commodity is made, the amount of labor is fixed, but not so its price. A residence built in a neighborhood that for some reason becomes undesirable may in a few years sell for half its original value. A painting that during the lifetime of the artist fetched but a few dollars may after his death be worth hundreds. Even his autograph, dashed off by a few strokes of his pen, may then sell for more than his painting did while he was alive. Of a stock of straw hats, those that sell in June for $4.50 have had the same labor expended on them as those that are reduced to $2.50 in August. A change of fashion may leave almost valueless a garment which cost much in labor. On the other hand, many things have great value even though untouched by the hand of man. Coal in the seam, iron, copper, gold possess value just as they lie in the earth.

That labor is an important factor in determining values no one for one moment doubts. Where the labor theory championed by Marx errs is in setting up labor as the sole source and determinant of values. Commodities do not possess value because labor has been spent on them but because they satisfy wants, and their supply is limited in relation to those wants. It is true that most commodities owe their want-satisfying power

largely to labor, which plays an important part in creating the utilities in economic goods, and that utility is one of the causes of value. Labor thus indirectly influences value through utility. Most commodities owe also their scarcity largely to the fact that labor must be spent on them and scarcity is the other cause of value. Labor, then, might be termed a secondary or indirect cause of value by virtue of its being a tributary cause of both utility and scarcity to whose union value owes its origin.

Value and Price.

We defined value as the power which a commodity possesses of commanding other things in exchange for itself. It is measured by the amounts of other commodities which one product is able to command in exchange. Under a system of barter, where things were exchanged directly for each other, their values would be expressed and measured in amounts of each other. The value of a bushel of wheat would be measured by the amount of corn, cloth, leather, or hats it would exchange for. To express the value of a number of articles in terms of every other would be a most awkward method of measuring and comparing values. With only 100 products to exchange, there would be required no less than 4,950 separate valuations. Very early in most countries, owing to the awkwardness of barter, some one commodity came to be used as a medium of exchange, and it became customary to express the values of all others in terms of this one commodity, known as "money."

By expressing the values of all commodities in terms of money, it is possible to compare the values of a multitude of the most diverse things, such as a doctor's skill, a lawyer's advice, a suit of clothes, a shave, or a Victrola. Money acts as a common denominator of values, a means of ascertaining at once the relative value of any one of a number of entirely different things, and in so doing tremendously facilitates the exchange of commodities. It has thus become a standard of value by which the values of all things are judged. The value of a bushel of wheat or a day's labor is no longer measured directly by the amount of other commodities which it might command in exchange but by the sum of money which it will bring in the market, which is termed its price. And the price of a commodity or service

has come to be universally regarded as the measure of its exchange value.

The fact that commodities are no longer exchanged directly for one another but indirectly through the medium of money tends to make us forget that the ultimate object of every sale of a product or service is not the money it brings but the commodities for which that money will eventually be exchanged. A sale is but one-half of an exchange, and the amount of commodities which are finally obtained depends not only on the price received from the sale but also on the prices paid for the purchased goods. The money value of a clerk's services for a month may be $100, but their real value is measured by the amount of commodities which he is able to purchase with his salary. The clerk does not work for money itself but for a home and the other things which it will buy. And though it is generally true that the amount of money the clerk receives is a measure of the amount of goods which he will be able to command, it is well to recognize that the price of a commodity or service is not its real value but a measure of its value and a measure which, though generally correct, is not always so. Just as the compass at different places does not accurately indicate true north, but a little east or west of it, so the money price of a commodity at different times may not accurately indicate its true value but may require a correction.

At any one time, the price of a product or service is an accurate measure of the amounts of other commodities which it commands in exchange. But prices change, and a change in price of one commodity does not always mean a corresponding change in its value. Suppose that at one date wheat is $1 a bushel, corn 75 cents a bushel, hats of a certain grade $2, shoes $4 a pair. If at the end of a certain period the prices of all these articles have doubled, their relative values remain the same. The price of hats has doubled, but so have the prices of other commodities, so that the value of hats in terms of wheat or corn is still the same. Though the farmer can sell his wheat at $2 instead of $1, he must pay double for his hats and shoes; he must still raise four bushels of wheat to purchase one pair of shoes. If the prices of all should fall to one-half their original amounts,

so that wheat sold for 50 cents and shoes at $2 a pair, their real values in terms of each other would still remain unchanged, and the farmer's four bushels of wheat would be worth a pair of shoes, as before.

A change in the prices of all commodities means a change in the value of money. A general rise in prices means a corresponding fall in the value of money. If prices double and wheat which was sold at $1 a bushel now sells at $2 a bushel, corn which before was 75 cents now sells at $1.50 a bushel, and $2 hats sell for $4, it is evident that a dollar will purchase now only half of these commodities that it would formerly, which is the same as saying that the value of a dollar has been cut in half. If there should be a general fall of prices to one-half their original amount so that wheat sells for 50 cents instead of $1 a bushel, and other commodities likewise, then a dollar will purchase two bushels of wheat where before it was worth only one; its purchasing power will be doubled, which means that the value of money will be doubled. Thus, prices and the value of money are usually said to vary inversely, whenever prices go up the value of money goes down, and *vice versa*. A like change in the prices of all commodities means a change in the value of money but leaves the value of any particular commodity unchanged. A rise or fall in the price of a commodity does not necessarily indicate a change in its true value, that is, its value in relation to other commodities.

On the other hand, the fact that the price of a commodity or service remains the same over a period of time does not necessarily indicate that its value is the same. For if, in the meantime, the prices of other commodities have risen, its value in relation to those commodities will have fallen. Suppose that at the entrance of the United States into the World War the salary of a clerk was $100 a month and that the prices of commodities have in the interim jumped 100 per cent. His $100 now purchases but half of the food, clothing, and shelter which it purchased before. The money value of his services may remain the same, but their true value in amounts of those things that maintain existence is cut in half. He may be granted a $50 raise and imagine that he is forging ahead, when, in reality, he is still a

quarter of a lap behind his old position. If, however, instead of rising, the prices of commodities should fall, and the wages of our clerk lag behind, his $100 would increase in value.

The general level of prices or the value of money changes but slowly, but the individual prices of most commodities change quickly and constantly, and a change in one means a change in its relation to others; so that, as a general rule, a rise or fall in the price of a single commodity registers a rise or fall in its value, and, for most practical purposes, price is the measure of value.

Having surveyed the origin and nature of value and noticed the relation of price to value, we are ready to see how prices are determined and what forces actuate their rise and fall.

Summary.

Division of labor necessitates an exchange of commodities between producers. The exchange of commodities gives rise to questions of value. As the great majority of people are buying and selling products or services, the laws that govern value are of interest to all. The two fundamental elements of value are utility and scarcity; all other causes affecting the values of things work through these two. Labor is a secondary cause of value; it helps to create utilities in goods and is a cause of their scarcity. The labor theory of value errs by setting up labor as the sole source of value. Under a system of barter, the values of things exchanged would be expressed and measured in terms of each other. Today, money is used as a medium of exchange, and the values of all other commodities are expressed in terms of money. The amount of money which a commodity will command in exchange, or its price, is not always an accurate measure of its value. This is because the value of money itself is subject to change. It varies inversely with changes in the general level of prices. For all practical purposes, however, price is the measure of value.

Test Questions

1. How does a division of interests spring up in a system of exchange?
2. Show the distinction between utility and value and the relation between them.

3. How does scarcity affect value?

4. What is the relation of labor to value?

5. Explain why at two different periods a change in the price of an article may not mean a change in its value.

6. What is meant by the statement that the value of money and prices vary inversely?

References

BÖHM-BAWERK, E. VON, "Positive Theory of Capital," Book III, Chaps. I–IX.

CAIRNES, J. E., "Character and Logical Method of Political Economy," Part I, Chap. I.

CAREY, M., "Political Economy," Chap. II.

CLARK, J. B., "Philosophy of Wealth," Chap. V.

CLAY, H., "Economics of the General Reader," Chap. XIV.

JEVONS, W. S., "Theory of Political Economy," Chap. III.

MARSHALL, A., "Principles of Economics," Book III.

SAY, J. B., "Political Economy," Book II, Chap. I.

SMART, W., "Introduction to the Theory of Value," Chaps. II–VIII.

SMITH, A., "Wealth of Nations," Book I, Chap. V.

PANTALEONI, M., "Pure Economics," Part I, Chap. I.

PIERSON, N. G., "Principles," Part I, Chap. I.

RICARDO, D., "Principles of Political Economy and Taxation," Chap. I.

WALSH, C. M., "Measurement of General Exchange Value," Chap. I.

WICKSTEED, P. H., "The Common Sense of Political Economy," Book I.

CHAPTER XII

THE LAW OF DEMAND AND SUPPLY

Statement of the Law.

Ask the average business man what determines prices and he will promptly answer, "Demand and supply." He expresses a truth hammered out of experience. It is a matter of universal observation that an increase or decrease in the supply of a commodity tends to lower or raise its price and, similarly, that any increase or decrease in the demand for a commodity tends to raise or lower its price. The market price of a commodity sold under competition is thus said to be governed by the law of demand and supply, which means that its price is determined by the relationship existing between the demand for it and the supply of it.

The Meaning of Demand.

In order to see just how this famous law operates in determining prices, we must first obtain a clear understanding of the terms "demand" and "supply," which are not quite so simple as they seem. In fact, considerable confusion has resulted through neglecting to define the exact meaning of both as they are used in reference to the above law. Demand, for instance, does not mean plain desire nor the mere amount of a commodity that will be purchased irrespective of the price. There is no one such amount but several varying with the prices asked. At a low price a comparatively large quantity will be bought; a higher price will induce a lesser quantity; and so on. At any one time, therefore, on a particular market, the demand for a commodity will consist of a number of different amounts which buyers will purchase at different prices. The amount that will be bought will always depend on the price asked. To speak of the demand for a commodity in the sense of the mere amount

that will be purchased, without reference to any price, is meaningless. It is impossible to estimate the amount that will be bought without knowing the price that is to be asked. Demand is a relationshp between quantity and price. The demand for any commodity is expressed by stating the amount that will be purchased at a certain price or the amounts that will be purchased at stated prices.

Demand Schedules.

On a local produce market at any given time, it would be possible for a produce man well acquainted with the market to figure out approximately the amounts which buyers would purchase at different prices. Such schedules are sometimes made up on the grain exchanges. A table of the amounts which buyers will purchase is called a "demand schedule" and is, in reality, an estimate of the demand for a commodity on a particular market at a given time. For the sake of illustration, let us suppose that, on a particular produce market on a certain date, buyers of apples will purchase the following amounts at the stated prices:

At a price of $1.00, 900 barrels will be bought.
At a price of 1.25, 800 barrels will be bought.
At a price of 1.50, 700 barrels will be bought.
At a price of 1.75, 500 barrels will be bought.
At a price of 2.00, 300 barrels will be bought.
At a price of 2.25, 100 barrels will be bought.

An Increase of Demand.

Now let us assume that the following season the demand for apples on this particular market has increased; apples, perhaps, have been extensively advertised, business conditions have been good, so that buyers will now purchase the following amounts:

At a price of $1.00, 1000 barrels will be bought.
At a price of 1.25, 900 barrels will be bought.
At a price of 1.50, 800 barrels will be bought.
At a price of 1.75, 700 barrels will be bought.
At a price of 2.00, 600 barrels will be bought.
At a price of 2.25, 500 barrels will be bought.

The second schedule illustrates what is meant by *an increase in*

demand. Larger amounts will be bought at the same prices than before. At a price of $1.75, buyers will now purchase 700 instead of 500 barrels.

The Law of Demand.

At any one time, without any changes taking place in the conditions of demand, a larger amount will be bought at a lower price. As the first schedule indicates, at a price of $1.75, 500 barrels will be bought, while at $1.50, buyers will take 700 barrels. The terms "expansion" and "contraction" describe better the increase or decrease in the amounts that will be purchased at lower or higher prices, under the same condition of demand. The fact that a larger amount will be purchased at a lower price does not signify an increase of demand in the true sense of the term; it simply illustrates a universal law, the law of demand, which states that the amount of any commodity which buyers will purchase varies inversely with the price. The higher the price the smaller the amount that will be purchased; the lower the price the large the amount.

Elasticity of Demand.

If the amounts vary greatly with price changes, the demand is said to be elastic; if they vary but little, it is said to be inelastic. A commodity is said to have an elastic demand when a small change in its price results in a great change in the quantity that buyers will purchase. The amount of such a commodity that will be bought will expand readily in response to a fall in price and contract readily in response to a rise in prices. Most luxuries or near luxuries or articles which have available substitutes possess an elastic demand. If prices for such articles go up, people restrict their purchases; if they go down, they buy more and others buy who before could not afford them. On the other hand, if the amount of a commodity that will be bought is not much affected by price changes, the demand for it is said to be inelastic. Most necessities are of this type: salt, matches, and bread, for instance; also production goods, such as machinery and tools. A rise or fall in the price of these will not greatly affect the amount consumed; demand for them is, therefore, said to be inelastic.

Supply Schedules.

In a similar manner, the amounts which sellers are willing to offer for sale will vary with the prices that can be obtained. A schedule of the amounts of a commodity that will be offered for sale on a particular market at a given time is called a "supply schedule." Such a schedule is an estimate of the conditions of supply for a commodity and illustrates what is meant by the term "supply." We will suppose that on the same produce market, at the same time, covered by the first demand schedule, sellers are willing to offer the following amounts at the prices stated below:

At a price of $1.00, 200 barrels will be offered.
At a price of 1.25, 300 barrels will be offered.
At a price of 1.50, 400 barrels will be offered.
At a price of 1.75, 500 barrels will be offered.
At a price of 2.00, 600 barrels will be offered.
At a price of 2.25, 700 barrels will be offered.

An Increase in Supply.

We will assume that in the following season, apples are more plentiful, owing to an abundant crop or to a decrease in the production costs or transportation charges, so that on the same market sellers are willing to dispose of the following amounts:

At a price of $1.00, 400 will be offered.
At a price of 1.25, 600 will be offered.
At a price of 1.50, 800 will be offered.
At a price of 1.75, 1000 will be offered.
At a price of 2.00, 1200 will be offered.
At a price of 2.25, 1400 will be offered.

This second schedule illustrates an increase of supply. The conditions of supply have changed, so that now larger amounts are offered at the same prices.

THE OPERATION OF DEMAND AND SUPPLY IN COMPETITIVE MARKET ILLUSTRATED

The next question is, *How* are prices determined by demand and supply in competitive buying and selling? In order to

illustrate their mode of operation, we will take the two schedules of apples, which represent the conditions of demand and supply for apples on a produce market at a given time:

Demand	Supply
At a price of $1.00, 900 bought	Price of $1.00, 200 offered
At a price of 1.25, 800 bought	Price of 1.25, 300 offered
At a price of 1.50, 700 bought	Price of 1.50, 400 offered
At a price of 1.75, 500 bought	Price of 1.75, 500 offered
At a price of 2.00, 300 bought	Price of 2.00, 600 offered
At a price of 2.25, 100 bought	Price of 2.25, 700 offered

Under the conditions of demand and supply given above, would $1 be likely to become the market price for apples? At that price, as the schedule shows, buyers are anxious to secure 900 barrels, but sellers are willing to offer 200 only for sale. The shortage would soon become apparent and there would be a rush of buyers, many of whom, rather than be disappointed, would offer higher prices, with the result that competitive bidding would force the price up. At a price of $1.50, the schedule indicates that there will still be a scarcity of apples for sale, in proportion to the demand for them, and sellers will not hesitate to take advantage of the competition among buyers and will boost the price. Should it rise to $2, sellers who up to this time have been holding back will put their supplies on the market until, as the schedule indicates, there will be 600 barrels offered for sale. The heightened price will also cause buyers to reduce their purchases and many of the poorer ones to drop out, so that the demand shrinks to 300 barrels. If the price were to be maintained at $2, only half of the supply would be disposed of. Competition among sellers, who do not wish to be left with a supply on their hands, will lower the price. At $1.75 a barrel, the schedules indicate that sellers are willing to sell and buyers to purchase the same amounts, namely, 500 barrels. This price would "clear the market" and satisfy all concerned. And this is the price that demand and supply with the aid of competition tend to establish. This is the natural market price, the natural price in that it is the price which demand and supply, when perfectly free from combination and monopoly, tend to establish

by competition. It is at bottom a psychological operation brought about by competing buyers and sellers, each seeking his own gain in a perfectly natural manner.

The Equilibrium Price and the Equation of Demand and Supply.

The price that demand and supply tend to establish is sometimes called the "equilibrium price"—a good name in that it suggests the real nature of this whole process of price determination, which is, in reality, a balancing of two opposite forces. The price which is finally fixed or to which all other prices are constantly tending is said to be the equilibrium price, on account of its being that one price which under the given conditions equalize demand and supply. In the two schedules above, $1.75 is the one price which equalizes the amounts which sellers wish to sell and buyers to buy. The fact that competitive prices are ever tending toward that one price which equalizes demand and supply has led economists to state that prices are determined by the equation of demand and supply. It is as if two blind forces were forever groping for the price that will establish their equilibrium and set them at rest.

Demand and Supply Charted.

The interaction of demand and supply is often illustrated by a diagram on which the schedules are represented by curves. In Fig. 2, distances along the line *OX* measure amounts of commodities; in this case, the unit amount is 100 barrels of apples, and distances up the vertical line *OY* denote prices. The curve *SS* is the supply schedule charted, indicating the amounts sellers will supply at the stated prices: At a price of $1 the curve shows that 200 barrels will be supplied, and so on; this curve ascends to the right, indicating the increase in the amount of the supply as the price goes up. In a similar manner, the demand schedule is represented by the curve *DD,* which registers the amounts that purchasers will buy at the stated prices and ascends to the left in accordance with the universal fact that the amount demanded decreases with the increase in price.

Determination of Equilibrium Price by the Equation of Demand and Supply.

This diagram serves as a map of a market for a commodity at a given time and charts the two great market forces, demand and supply. It pictures the equilibrium price which, when demand and supply are charted in this manner, will always be at the intersection of the two curves. At a price of $1.50, the supply curve registers a supply of 400 barrels, while the demand curve shows buyers anxious to purchase 700. At this price, the demand is heavier than supply and will force the price upward by com-

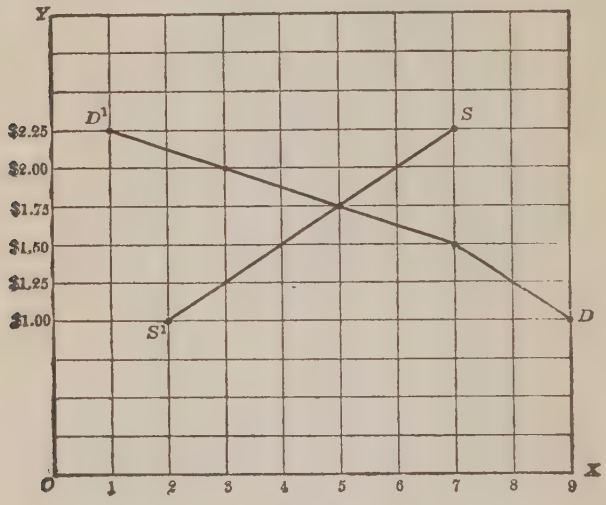


FIG. 2.

petitive bidding. It might rise to $2, but at this price level the curves indicate a demand for 300 and a supply of 600 barrels. Buyers will hang back, while competition among sellers will be active, and this condition of light demand and heavy supply will force the price down. The diagram shows that at the price level of $1.75, the two curves intersect, indicating that buyers are willing to buy and sellers ready to sell the same amount at that price, which is the one price under the given conditions which equates demand and supply.

Notice by the diagram that at any price above this intersec-

tion the supply will always be heavier than the demand, in consequence of which the price will be forced downward. At any price below the intersection, demand will overbalance supply and the price will be forced upward. Whatever the actual prices are, therefore, whether above or below the equilibrium price, they will always tend toward it, actuated by this balancing process of demand and supply working through competition. Just as the delicate needle of the mariner's compass ceaselessly oscillates to and fro, never resting, never satisfied till it points to magnetic north, so price, continually swinging back and forth, always seeks that point on the market compass that satisfies its nature as magnetic north does the steel needle.

The Interaction of Demand and Supply Illustrated by Diagrams.

The statement that prices are determined by the interaction of demand and supply is well illustrated by graphing the effect of a change in the conditions of either demand or supply on the equilibrium price. Thus far, in order to illustrate the principle, we have assumed the conditions of both to be constant; we have

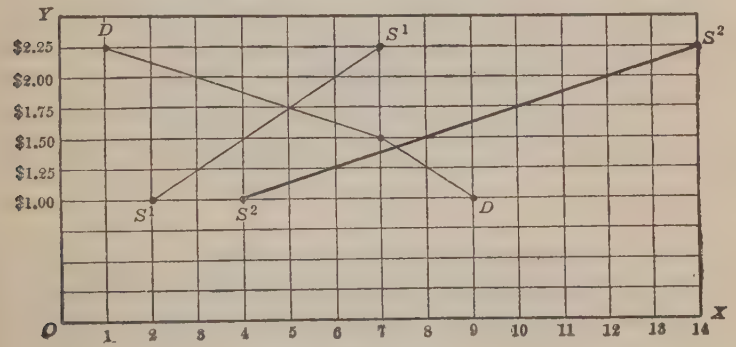


FIG. 3.

taken the market conditions at a given time; but in actual life the conditions of either demand or supply do not remain the same for long but are frequently changing, causing actual prices to swing up and down, as stated above. Figure 3 registers the effect of a change in the conditions of supply on the equilibrium price.

The demand curve DD is identical with that of Fig. 2, and the supply curve S^1S^1 marks the old conditions of supply. The curve S^2S^2 indicates an increase of supply, showing that sellers are now offering larger amounts than before at the stated prices. At the old price of $1.75, there is a demand as before for 500 barrels, but the curve S^2S^2 points to a supply of 1,000 barrels. This increase in supply will lower prices. As the chart shows, the new curve S^2S^2 intersects DD lower down, establishing an equilibrium price somewhere between $1.50 and $1.25. If the supply had decreased, its curve would run above and to the left of S^1S^1 and would, therefore, intersect the demand curve higher up, establishing a higher equilibrium price, toward which the market prices of the commodity would then tend.

Figure 4 registers the effect of an increase in demand on the

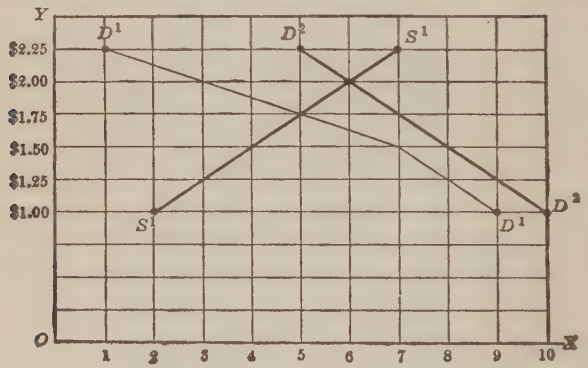


FIG. 4.

price. The new curve D^2D^2 runs above and to the right of the old curve D^1D^1, cutting the supply curve S^1S^1 at a higher point and thus establishing a new and higher equilibrium price. It is thus easy to visualize how any change in either demand or supply, or in both, affects the price of any commodity sold under competition. It would not be possible to chart the demand or supply of a commodity with the exactitude that we have done here, though, as we have intimated, the demand and supply for many commodities can be estimated approximately. We have utilized these schedules, which are estimates of actual conditions, to illustrate the operation of a universal law. The prices

of all commodities sold under competition are governed by it, and not only the prices of commodities but also the services of men and women; most of us live under its sway, and the amount of this world's goods that falls to the lot of each of us is meted out to us largely by this same law.

Changes in Demand and Supply and Price Fluctuations.

In actual affairs, changes in demand due to fickle fashion, changing tastes and habits, increased or decreased purchasing power of consumers, or changes in the general level of prices are constantly causing changes in demand. At the same time, new inventions, new discoveries of raw materials, new processes of manufacture, weather conditions bring about changes in the supply of commodities. Many of these causes are so remote from the consumer that he is totally unaware of them; he feels, however, their effects on prices. The more rapidly these changes occur the more rapidly the price fluctuates. On a typical grain market, with its intricate system of world communication, which keeps it in almost instantaneous touch with happenings affecting the demand and supply of grain in all corners of the earth, prices are fluctuating every minute or hour of the day. The demand and supply of many staple manufactured articles do not change so rapidly, and their prices, therefore, change more slowly. The estimation of the present and future conditions of demand and supply of commodities, then, plays a very important part in everyday business practice, for it is by this means that changes in prices can be foreseen.

Summary.

The prices of all commodities sold under competition are governed by the relationship existing between their demand and supply. By demand is meant the quantities of any commodity that will be bought at different prices. A table of the amounts that it is estimated buyers will purchase at certain prices is called a "demand schedule." Such a schedule is an estimate of the demand for a commodity on a given market at a given time. Experience has shown that the higher the price the smaller will be the amount purchased, and the lower the price the larger will be the quantity purchased. This is known as the "law of de-

mand" and can be stated by saying that the amount of any commodity purchased will vary inversely with the price. If the quantity varies greatly with price changes, the demand is said to be elastic; if there is only a slight variation with a change of price, the demand is said to be inelastic.

The amounts which sellers are willing to offer for sale will vary with the prices that can be obtained. A schedule of the amounts which sellers will offer for sale at different prices is termed a "supply schedule." Such a schedule represents the supply of a commodity in a given market. The amount of a commodity offered for sale varies directly with the price.

Competition between buyers and sellers on a given market will tend to bring about a price that will "clear the market." Such a price is termed the "equilibrium price," on account of its being the one price which, under the given conditions, equalizes demand and supply. The interaction of the forces of demand and supply will always force the price toward this point of equilibrium. Changes in the conditions of demand or supply will result in a new equilibrium toward which the market price will tend.

Test Questions

1. What is meant by the statement that the price of a commodity is governed by the law of supply and demand?
2. What is demand? What is a demand schedule?
3. State the law of demand.
4. What is meant by elasticity of demand? Mention four commodities possessing elastic demand; four with an inelastic demand.
5. What is a supply schedule?
6. Explain how in a competitive market an equilibrium price would tend to be established.
7. Show by a diagram how a change in demand will raise or lower the equilibrium price.

References

BÖHM-BAWERK, E. VON, "Positive Theory of Capital," Book IV, Chaps. I–VI.

CAIRNES, J. E., "Character and Logical Method of Political Economy," Chap. II.

CARVER, T. N., "Distribution of Wealth," Chap. I.

CLARK, J. B., "Philosophy of Wealth."

EDIE, L. D., "Principles of the New Economics," Chap. IX.
ELY, R. T., "Outlines of Economics," Chap. X.
FETTER, F. A., "Economic Principles," Part I.
HOBSON, J. A., "Economics of Distribution," Chap. II.
MARSHALL, A., "Principles of Economics," Books III and V.
MILL, J. S., "Principles of Political Economy," Book III, Chaps. I. II.
SELIGMAN, E. R. A., "Principles of Economics," Chap. XII.
TAUSSIG, F. W., "Principles of Economics," Vol. I, Chaps. VIII, IX.
WICKSTEED, P. H., "The Common Sense of Political Economy," Book II, Chap. IV.
WIESER, F. VON, "Natural Value," Book V.

CHAPTER XIII

THE FORCES BEHIND DEMAND; THE DETERMINATION OF INDIVIDUAL DEMAND

The Real Forces Determining Prices are behind Demand and Supply.

The law of demand and supply is a general law. An explanation of its action does not disclose the real forces determining prices. We have spoken of demand and supply as forces, but in so doing it is evident we have used the word "force" loosely, for they are not by any means elemental forces but rather the resultants of other forces working beneath them. The law of demand and supply expresses the relationship that exists between the demand for a commodity and the supply of it; but demand and supply themselves are relationships between amounts and prices. By demand is meant the largest amounts of a commodity which buyers will purchase at certain prices or the highest prices that will be paid for certain amounts. Likewise, supply means the largest quantities that will be offered for sale at certain prices or the lowest prices at which certain quantities will be offered for sale. After we have discovered how prices are determined by demand and supply, we have only scratched the surface of the price problem. It still remains to discover what determines both demand and supply. Each of these represents a condition, and the real question at issue is, What determines the conditions of demand and supply? What determines the largest amount of a commodity which buyers will purchase at a certain price or sellers will offer for sale? The estimation of demand, which, as we have intimated, is of practical importance in everyday business, requires a knowledge of the forces underlying demand and of the way in which they operate in the fashioning of price.

What Determines Individual Demand.

The total demand for a commodity is the aggregate of all the individual demands for that commodity. If, for instance, there is a demand on a local produce market for 800 barrels of apples at a price of $1.25, it means that there are buyers of apples in that market who together will purchase that quantity at that price. The demand schedule of a commodity is simply a total estimate of the amounts which individual buyers will purchase at stated prices. Individual demand schedules added together constitute the demand schedule for the whole market.

As the demand for a commodity is compounded of individual demands, the question narrows itself down to what determines the demand of the individual. What are the forces that influence the buyer? What determines the highest price which an individual will pay for a certain amount of a commodity or the greatest quantity that he will buy at a certain price?

The Determinants of Individual Demand.

The highest price which a normal individual will pay per unit for a certain amount of a commodity or what amounts to the same thing, the largest number of units which he will purchase at a given price is determined by a comparison of the marginal utility of the commodity with the utility of the money which he must pay. This is the principle that governs the buying of the individual. The two forces determining his demand, then, are the desire for the commodity and the desire for money or, as sometimes stated, the utility of the commodity and the utility of money. Such is the formal statement of the case. In the previous chapter, it was seen how the market price was influenced by the interaction of demand and supply. In this chapter we will notice how the price which the individual will pay is determined by the interaction of the two primary forces, human want and love of money, preeminent in their influence on human conduct.

The Principle of Diminishing Utility.

Before we explain how individual demand is influenced by these forces, we will see how these forces are themselves governed

by certain principles. Every small boy knows that the first apple tastes better than the second, the second than the third, and that if he but has enough, there comes a time when he even loses his enthusiasm for apples. Now, the small boy's diminishing desire for apples illustrates a law of human nature as universal as the law of gravitation. We are all in the same boat with the small boy and find that the intensity of our wants decreases as the supply of that which satisfies them increases. It follows, therefore, that units of any commodity decrease in utility as their supply is increased, and if the supply finally exceeds our wants, their utility shrinks to zero. This universal experience is usually referred to as the law of diminishing utility, and, simple as it is, it is at the bottom of the whole price question.

THE CONCEPTION OF MARGINAL UTILITY

Arising out of this universal fact that similar units of a commodity when used yield decreasing utilities is the conception of marginal utility. The last unit to be consumed possesses the least utility of any; this unit is termed the "marginal unit," and its utility is referred to as the "marginal utility" of the supply. If our small boy had a limited supply of these apples, the last one eaten would yield the least utility of any of the three, and its utility would measure the marginal utility of his supply of apples. Whenever the marginal utility of a supply of a commodity is spoken of, it refers to the least utility possessed by any unit, which is always that of the last to be consumed.

How Marginal Utility Determines the Utility of each Unit of the Supply.

The conception of marginal utility is important because it determines the estimate which we as individuals place on the utility of each unit of a commodity which we may have in our possession or contemplate possessing by purchase or otherwise. We have just noticed that similar units of a commodity when considered as a supply to be used possess varying degrees of utility. Similar units of a commodity, however, regarded as a stock in our possession have equal utilities. This seems a contradiction, but it is merely a change of viewpoint. As the owner of a stock consisting of similar units—three apples, for example

—we should regard them all alike. If we were to dispose of one, it would not matter which, for they each have the same utility. But let us consider these three apples as a supply to be used, and each has a different utility—the first to be eaten, the greatest; the last to be eaten, the least. If we now dispose of one of our supply, which will it be? Always the one with the least utility, the marginal apple; for we will eat the two that remain, and it will be the third that we will be short of. It makes no difference which apple is taken, it will always be the one with the least utility, so that when we regard the three apples as a stock in our possession, the estimate which we will place on each will be determined by our estimation of the utility of the least or marginal unit of those same apples regarded as a supply to be used.

The Law of Marginal Utility.

Suppose that we increase our stock and now have in our possession four apples. To each of these we attach the same importance, namely, that determined by the utility yielded by the last of them to be enjoyed when regarded as a supply to be used. This last would now be the fourth apple, which possesses less utility than did the third of the smaller supply; accordingly, each of the four apples of our increased stock possesses less utility than the three of the previous stock. By adding a fourth apple to our supply, we have lowered its marginal utility. For this is the law of marginal utility, that it varies inversely with the supply—increase the supply and you inevitably lower its marginal utility; decrease it and you just as surely raise the marginal utility. As, therefore, marginal utility determines the utility of each and every unit of the supply considered as a stock, it follows that any increase in the supply lowers the utility of each unit of any stock in our possession or which we might be about to place in our possession by purchase or otherwise; conversely, any decrease will raise each unit in our estimation.

Marginal Utility and the Law of Demand.

It is apparent that we are now involved in psychological considerations. We have just explained the principle which governs our valuations in all spheres of life and furnishes the reason underlying a universal fact in our experience—that the more

of a thing we have the less we value it, and *vice versa*. This same principle underlies the law of demand, which states that the higher the price the smaller will be the amount sold and that the larger the amount to be sold the lower the price it will fetch. The larger the amount the lower its marginal utility and the utility of each unit to the buyers, who will naturally be willing to pay less per unit; the smaller the amount to be disposed of the higher will be its utility and the higher will be the price the buyer will pay. While these principles of diminishing and marginal utility explain the law of demand as applied to an individual, they do not completely account for the law in the market as a whole, for the reason, to be taken up later, that the utility of money varies with different individuals.

Marginal utility, therefore, is a practical principle, entering into everyday business practice. We may be entirely unaware of it, yet it governs our actions just the same. In buying, we are constantly estimating marginal utilities; it is a question of one more or less. Shall we buy two or three collars, ties, or, if disgracefully wealthy, cars? In so doing, we are comparing marginal units, the third collar, the second necktie, with the money which we must pay. And now that we have become better acquainted with these powerful psychological principles influencing economic activity, we are ready to see how they operate in determining the demand of the individual buyer.

How Marginal Utility Influences the Demand of the Buyer.

Every good buyer seeks to spend his income in such fashion as to receive the greatest amount of utility in return for the least expenditure of money. In purchasing a single unit of a commodity, such as a Victrola or a Winchester rifle, he compares its utility with that of some other commodity which he might like to buy with the money that he is asked to pay. If, at the price asked, the utility of the money in his estimation overbalances that of the article, he refuses to buy—"it isn't worth the money." If the price seems small in proportion to the satisfaction that he will get out of the article, he gains by the exchange. The highest price that he will pay is determined by a comparison between the utility of the article and that of the money price. But the question is, when he buys several units of a commodity,

which, as we have seen have varying degrees of utility, What decides his purchase? What determines the largest amount that he will buy or the highest price that he will pay for a certain quantity? There we bring into action our knowledge of marginal utility and answer by saying that the demand of the buyer is determined by a comparison of the marginal utility of the commodity with the utility of the money price.

We will now see how this principle governs the buying of the individual, and in order to illustrate it fully we will purposely exaggerate the exactness with which we are able to measure the utility of the commodity in terms of money. In practical affairs, money is the only measure that we can apply to utility, and we all are constantly measuring the utility of commodities in terms of it, by the comparisons we make with the marginal units of our purchases. We will assume that 1 unit of commodity utility is equal to the utility of 1 cent. In so doing, we are measuring the utility of the commodity in terms of money. We will suppose that the first unit of a limited supply of a commodity—apples or any other article of which we might purchase four or five—would possess 25 units of utility, the second 20, the third 15, the fourth 10 and the fifth 5. If the buyer were to pay in proportion to the utility of the commodity to him, rather than go without, he would be willing to give (as 1 degree of utility equals 1 cent) 25 cents for the first unit. So much he would pay and no more. He would likewise be willing to pay as much as 20 cents for the second, 15 cents for the third, 10 cents for the fourth, and 5 cents for the fifth. But apples are not bought in this manner today, and the question is what would determine the largest amount that he would buy at any given price, let us say, 10 cents. His fondness for the commodity as indicated by his utility scale would lead him to buy two or three without any hesitation at 10 cents apiece. He might be undecided whether to buy three or four. The utility of the fourth apple and the utility of 10 cents are equal. The utility of the fifth unit is less than that of 10 cents; so that he will not pay 10 cents for it. The largest amount which he will buy, therefore, at the given price of 10 cents is four. He would lose on every unit which he would buy over four. The amount, then, that he will purchase at any given price is determined by the balancing of the marginal

utility of the commodity with the utility of the money which he must pay for it. Just as soon as the utility of the last unit considered is equal to the money price, he stops buying. It is the marginal unit acting as a danger signal that halts the buyer, while a comparison between its utility and that of the money that must be paid determines his purchase.

This principle may be graphed, as in Fig. 5. Distances along the line *OX* denote units of the supply; distances up the vertical line *OY* measure both units of commodity utility and of money. The curve *UU* is the utility curve, its downward slope indicating the diminishing utility of the supply, of the five units. The shaded section represents the utility of the fixed price of 10 cents. The utility of the fourth apple is slightly greater than the utility of the price, as shown by the excess of the white in area 4. In the fifth area, the utility curve cuts through the shaded part, denoting that the utility of the fifth unit is less than that of the price, 10 cents. The marginal utility of any given amount is measured by the height of the line of its marginal unit. For instance, the marginal utility of a supply of four units is measured by the height of the line *PP*. The price level of 10 cents cuts the utility curve at *P*, showing that the utility of that amount of money is equivalent to the marginal utility of a supply of four units. The amount which the individual will purchase at any given price will be indicated on the diagram by the intersection of the utility curve and the given price level.

This Principle Determines the Individual's Demand Schedule.

We are now able to make up the individual's demand schedule; for the same principle that determined the amount which he buys at 10 cents determines his purchase at all prices. If the commodity was selling at 20 cents, he would buy but two; the third unit would be worth only 15 cents, possessing a utility of only 15, so that he would not pay 20 cents for it. His demand schedule, then, would be as follows:

At a price of 25 cents, he will buy 1.
At a price of 20 cents, he will buy 2.
At a price of 15 cents, he will buy 3.
At a price of 10 cents, he will buy 4.
At a price of 5 cents, he will buy 5.

The Effect of an Increase in Utility on Individual Demand.

Any change in the buyer's desire for the commodity, the utility of money remaining unchanged, would either increase or decrease his demand. If, for example, due to creative advertising or other causes, the commodity were raised in his estimation, his desire for it would be intensified, its utility correspondingly increased; he would thus be induced to purchase a larger quantity or pay a higher price, and, in consequence, the amounts in his demand schedule would be increased all along the line. This is illustrated in Fig. 6 by raising the utility curve U^2U^2 above and to the right of the old curve in Fig. 5. The marginal utility

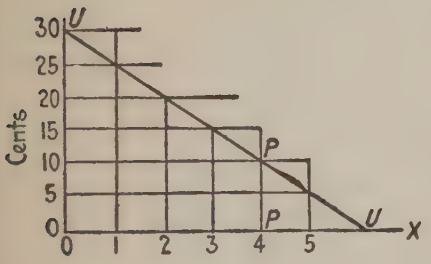


Fig. 5.

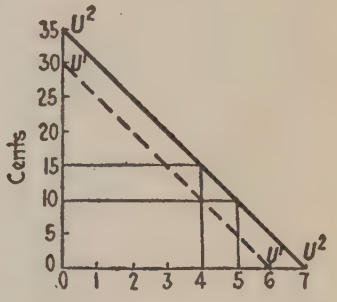


Fig. 6.

of a supply of four units has now increased from 10 to 15; the buyer will, therefore, be willing to pay 15 cents for four apples instead of the 10 cents indicated, by the old schedule, or, as the fifth unit has now a utility of ten, he would buy five units at the old price of 10 cents. An increase in the utility of the commodity has increased his demand at a price of 10 cents from four to five units, and likewise through his whole demand schedule, which will now be

At a price of 30 cents, he will buy 1.
At a price of 25 cents, he will buy 2.
At a price of 20 cents, he will buy 3.
At a price of 15 cents, he will buy 4.
At a price of 10 cents, he will buy 5.
At a price of 5 cents, he will buy 6.

Maximum Gain.

There is one more conception worth noting on account of its practical bearing on life, and that is maximum gain. The amount the buyer purchases is determined, we have said, by a comparison of the marginal unit with the price; we might say that the buyer will keep purchasing till the last unit considered shows no gain in utility over that of the money that must be paid for it. It is evident that when a number of units are purchased at a fixed price and that price is determined by the utility of the marginal unit, the one with the least utility of any, the buyer gains in utility on each of the preceding units. For the sake of illustration, let us take the case of one buyer. Column 1 below shows the utilities of successive units to him. Column 2 denotes the utility of the fixed price of 10 cents. Column 3 indicates the gain in utility of each unit of the commodity he buys at a fixed price of 10 cents. Column 4 shows his maximum gain.

	Utility of successive units of commodity	Utility of money price	Buyer's gain per unit or loss	Maximum gain
First unit	25	10	15	15
Second unit	20	10	10	25
Third unit	15	10	5	30
Fourth unit	10	10	0	30
Fifth unit	5	10	(− 5)	25

The fourth column shows that the buyer's gain increases as he buys and reaches its height at the third and fourth units. By purchasing three or four units he derives the maximum gain from the transaction. He may be undecided whether to buy three or four, but he will not buy five, as it will reduce his maximum gain; five marks the point of *diminishing returns* to the buyer; every unit which he buys thereafter reduces his gain.

Should he buy only two units, he will fail to secure the maximum gain. We may say, therefore, that the buyer's purchase is determined by the point of maximum gain.

This surplus gain accruing to the buyer has been termed by Marshall, the English economist, "consumer's surplus"; it is the difference between the total utility of the commodity and the total utility of the money which the consumer pays for it and thus represents a surplus utility to the consumer. The total utility of the purchase of our buyer above would be found by adding up the successive utilities in column 1 of the 4 units which he purchases, which together equal 70. The total utility of the money which he pays for these is 40, leaving him a surplus of 30.

Purchaser's Profit.

Failure to grasp this fundamental idea of the mutual advantage of exchange has been the origin of more than one popular economic misconception and much practical economic misconduct. It is plain to all that the seller gains by the sale; but the complementary fact that the buyer gains by a purchase has not always been so clear. Due to this one-sided vision was the idea on which the mercantile policy of Great Britain rested in the eighteenth century, that the prosperity of the nation depended on "a favorable balance of trade," an idea which still persists in the belated minds of many of us. The old idea of an exchange was that of a bargain, in which one party to the transaction was worsted, usually the buyer, as the Roman proverb *caveat emptor* signifies. It seems likely that our British brethren inherited the mercantile idea from this old Roman conception of an exchange. The idea has not, however, remained in Great Britain, and it is to be hoped that those statesmen who hold the foreign policy of our country in their hands at this critical juncture have sufficient economic knowledge to realize its falsity.

The modern conception of trade as a fair exchange, of adequate service rendered to the buyers by the seller, so emphasized in selling today, is a healthy sign of better times. Sharp practices, though still indulged in, are not countenanced by the ethics of the times. We are beginning to recognize that trade, to be permanent, whether between individuals or nations, must be profitable to both parties to the transaction.

Summary.

To get at the real forces determining prices we must go back of both demand and supply. The total demand for a commodity is made up of individual demands. The question, then, is, What determines the demand of the individual? The purchase of the individual buyer is determined by a comparison between the marginal utility of the commodity and the utility of the money which he must pay for it. Individual demand is thus determined by the interaction of two opposite forces, the desire for commodities and the desire for money, or commodity utility and money utility. Similar units of a limited supply of a commodity when used vary in utility, decreasing as the supply increases. The marginal utility of the supply determines the utility of each and every unit of that supply regarded as a stock in our possession. In everyday life, buyers are constantly comparing the marginal units of their purchases with the money price. It is this balancing of the utility of this marginal unit with the utility of the money which he must pay for it that determines the demand of the buyer. Any change in the intensity of the desire of the buyer for the commodity raises its marginal utility and increases or decreases his demand. In following out the principle, the buyer secures a maximum gain of utility, which constitutes his profit on the purchase, a return in utility over and above what he gave.

Test Questions

1. What are the two determinants of individual demand?
2. What is the law of diminishing utility?
3. What is meant by "marginal utility"?
4. How does marginal utility influence the demand of the buyer?
5. What is meant by "maximum gain"?
6. What is the difference between the old and the new conception of a sale?

CHAPTER XIV

THE DETERMINATION OF TOTAL DEMAND

The Influence of the Utility of Money on Individual Demand.

Thus far we have emphasized the influence of commodity utility on individual demand. We will now examine the part that money utility plays, which, though important, is not always so apparent.

The utility of money itself varies with different individuals and with the same individual at different times, due chiefly to changes in the general level of prices and in the incomes of buyers. The law of marginal utility affects money in common with other possessions—not, perhaps, to the same degree, on account of the fact that money can be used to satisfy other wants than that for itself; but as the most intense of these are satisfied first, it follows that the more money a man possesses the less he thinks of a single dollar, and *vice versa.* To a poor laborer a dollar has a far greater utility than to a millionaire. In common parlance, a dollar looks twice as big to some than others, and this variation in the utility of money to different individuals will naturally make a difference in their demand for commodities. Imagine a clerk in moderate circumstances falling heir to a fortune of half a million dollars; would not the utility of a dollar shrink in his estimation, and, in consequence, would not the amount of commodities which he would buy and the prices which he would be willing to pay increase correspondingly?

The Effect of a Decrease in the Utility of Money on Individual Demand.

To illustrate the above principle, let us notice how a decrease in the utility of money will affect the demand schedule of our buyer in the last chapter. We will suppose that he has been lucky enough to fall heir to a fortune and that a dollar seems

about half as big as in his poorer days, which is the same as saying that the utility of money to him is just half what it was. Instead of 1 cent being equal to one commodity utility as before, it will now be equivalent to one-half a commodity utility. He will be willing to pay at the rate of 2 cents for each utility, just twice as much as before. As his fondness for the commodity remains the same, there will be no change in his utility schedule, which is as follows:

The first unit has a utility of 25.
The second unit has a utility of 20.
The third unit has a utility of 15.
The fourth unit has a utility of 10.
The fifth unit has a utility of 5.

The first unit would be worth in his estimation 50 cents, the second 40 cents, and so on down, each double the amount that it was worth before. He will, therefore, be willing to pay a higher price for any given amount or purchase a larger quantity at any given price. Before, at a price of 20 cents, he would buy no more than two, as the third unit possessing only a utility of 15 was not worth 20 cents. Now that he is rich, he does not hesitate to buy three and will probably buy four. He would be willing to pay 30 cents for the third unit if necessary, and the utility of the fourth, which is ten, is just equal to the utility of 20 cents in his estimation.

As a poor man, the highest price which he could have been induced to pay for a given supply of three units would have been 15 cents. Now that the utility of money has changed, he will pay as high as 30 cents for a supply of three units. The utility of the marginal unit, the one which he compares with the money that he must pay, remains the same, namely, 15; the utility of the money that he compares it with being half what it was, he will be willing to pay just double his previous price for the same utility. As a result, the prices which he will pay for given amounts and the amounts that he will buy at given prices will be raised all along the line. The increased demand due to the change in the utility of money to the buyer is shown in Fig. 7 by the demand curve D^2D^2. Distances along the horizontal line OX denote units of the commodity; the figures up the line OY

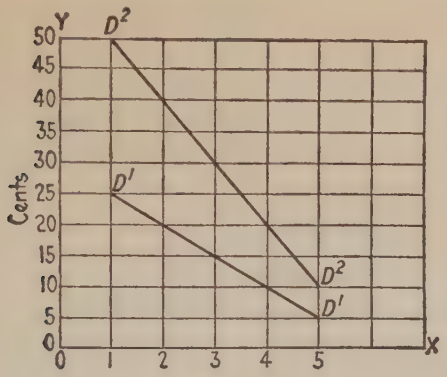


FIG. 7.

indicate prices. The two curves D^1D^1 and D^2D^2 register the demand before and after the change in the utility of money.

What Is Meant by the Utility of Money?

Our analysis reveals two elemental forces at work determining individual demand. The first of these, human want, is a positive, compelling force. The second, which we have termed the "desire for money," is a negative, repelling force the nature of which needs a little further elucidation. What we have spoken of as desire for money or, objectively, as money utility, is, at bottom, a dislike to parting with money and represents the cost of the transaction to the buyer. The money stands for what he must pay for the commodity, and its utility measures the sacrifice which he makes in return for the satisfaction of his want. The real force of which we have taken the utility of money to be the measure is the feeling of sacrifice that he experiences as he considers what he must pay. The money he pays may stand in his mind for the effort that he has made to earn it. The income of most buyers does, in reality, represent the effort that they have put forth in production—which effort they have exchanged for money income, which money income they finally exchange for commodities. It may, also, represent some other commodity. A man may be undecided whether to spend $35 on a set of Robert Louis Stevenson or a rifle. In his mind there will be a balancing of Stevenson and the rifle. If he decides to pur-

chase the books, it is at a sacrifice of the rifle. As money is the universal measure of value, we have become so accustomed to balance what we buy with it, to estimate the worth of commodities in terms of it, that we automatically come to regard it as what we pay. Hence, for all practical purposes, we may measure and speak of this force in terms of money.

The Codetermination of Demand.

Buying is a mental process in which two ideas are balanced in the buyer's mind—the utility of the article or the marginal utility of the supply which he is considering, and the utility of the money which he must pay. This fact requires emphasis, as one of the modren theories of value—the marginal utility theory, as it is commonly expounded by economists—through neglecting the part played by the utility of money, exaggerates the influence of commodity utility on price. Now, as we have seen, the utility of the commodity, the power it possesses to command desire, is the positive and more active factor, but to ignore the utility of money, the power it possesses to command desire and influence the decision of the buyer, is to ignore one of the facts of the case and result in a one-sided theory of value. In practical life, the pocketbook plays a prominent part in deciding the purchaser's demand, and any theory of value which does not take into sufficient consideration the influence of money utility does not square with the facts of the case. There are two determinants of individual demand, the utility of the commodity and the utility of money; these together decide the highest price which the individual will pay for any given amount and the largest quantity which he will purchase at any given price.

The Formation of Total Demand.

We will now observe how the total demand for a commodity is made up out of the individual demands; tracing it from its rise in the springs of human wants, watching its flow down through the lower and lower levels of price, constantly increasing its volume by fresh supplies, like a river on its way to the sea. We will assume that consecutive units of a given commodity possess the following utilities to four individuals, A, B, C, and D:

TABLE V

Units	A	B	C	D
First	25	40	15	25
Second	20	35	10	20
Third	16	30	5	16
Fourth	14	25	..	14
Fifth	10	20	..	10

We will also assume that the utility of 1 cent to D equals one commodity utility and that the utility of money to D is four times as great as to A; thrice as great as to B; and twice what it is to C. Each, then, will be willing to pay the following prices for consecutive units of the commodity:

TABLE VI

Units	A	B	C	D
First	$1.00	$1.20	$0.30	$0.25
Second	0.80	1.05	0.20	0.20
Third	0.64	0.90	0.10	0.16
Fourth	0.56	0.75	....	0.14
Fifth	0.40	0.60	....	0.10

Their demand schedules will be as follows:

TABLE VII

At a price of	A	B	C	D	Total
$1.00	1	2	..	..	3
0.80	2	3	..	..	5
0.60	3	5	..	..	8
0.50	4	5	..	..	9
0.40	5	5	..	..	10
0.30	5	5	1	..	11
0.20	5	5	2	2	14
0.10	5	5	3	5	18

The total demand for the commodity, found by adding the individual demands, is indicated in the last column to the right.

Analysis of Total Demand.

Figure 8 charts the total demand, showing the order in which the units that constitute it would be purchased by the buyers and the utility and values of each. Height above the horizontal line *OX* measures both degree of utility and money price. Prices are indicated up the line *OY*. Distances along the line *OX* measure units of the commodity; the numbers indicate the order of the units that will be bought; the capital letters, the buyer. The third unit will be purchased by A, the small 1 indicating that it is A's first unit. The dotted curve

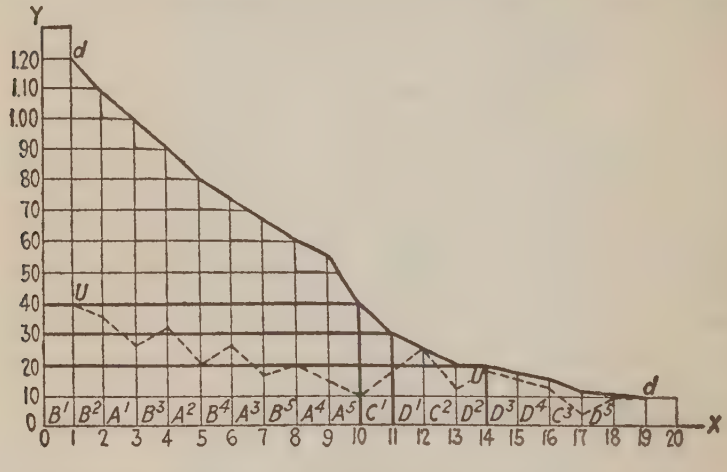


Fig. 8.

UU registers the degree of utility of the units; the demand curve *dd* registers the price that will be paid for each unit or number of units and the amount that will be bought at any price. The utility of the third unit is, for example, measured by the height of the vertical line rising from 3 to the dotted curve, namely, twenty-five, which is the utility of the first unit to A. Its price is measured by the height at which the vertical line cuts the demand curve, equal to $1, or the price that A is willing to pay for his first unit. The heavy black lines indicate the

amounts that will be bought at the stated prices, or the prices that will be paid for given amounts.

Figure 8 furnishes us with a complete analysis of total demand. It shows the price that each consecutive unit would bring, by whom it would be bought, and its utility. It shows us the demand at any price and of what individual demands it is compounded. It also shows us the relationship of utility to the total demand. Having thus seen how the total demand is built up out of individual demands, we are now ready to see how it is determined.

The Determination of Total Demand.

The question is, What determines the highest price that will be paid for a given amount or the largest amount that will be bought at a given price. What, for instance, decided the amount that will be bought at 30 cents. A and B are willing to take 10 units at a price of 40 cents: at that price, they buy their limit; hence, they do not decide the demand at a level of 30 cents. The amount that will be bought at a price of 30 cents is determined by C, who is termed the "marginal buyer" and is responsible for the increase in the demand at the lower price. In the same way, he determines the highest price at which a supply of 11 units of a commodity will be bought. The highest price which 10 units will bring is 40 cents. At that price only 10 units would be purchased. If 11 units are to be bought they must be offered at a price to tempt C which is 30 cents.

Likewise, the demand at any point will be determined by the marginal buyer or, less strictly speaking, the marginal group of buyers. The diagram indicates that at a price of 20 cents there is a demand for 14; the increased demand is here due to C buying more and the purchase of a new buyer D. A and B are not effective buyers, and their purchases do not increase the demand at this price. We would call C and D the marginal buyers; their valuations determine the price at which a supply of 14 units will be bought. Strictly speaking, it is the last purchase of the last buyer which determines the highest price at which any amount will be bought in this case; the price that D is willing to pay for his second unit determines the one highest price at which the whole supply of 14 would be purchased.

Now, since it is the purchase of the last buyer that decides the total demand, and since that purchase, as we have seen, is decided by a comparison of the utility of the commodity with the utility of money to him, we may say that the greatest amount of any commodity that will be bought at any given price or the highest price that will be paid for any given amount is determined by a comparison of the marginal utility of the commodity by the marginal buyer or group of buyers with the utility of the money price.

Marginal Utility and Total Demand.

It is well to notice here the relation of marginal utility to the determination of total demand. The marginal-utility theory of value, as often stated by many economists, that the price of a limited supply of a commodity is determined by its marginal utility, is highly misleading. It is not the unit possessing the least utility of the whole supply that influences the price, but the unit which has the least utility to the marginal buyer. This unit would possess the least utility only if the utility of money were the same to all buyers, which it never is. In the case of the individual to whom, at any given time, the utility of money is the same, consecutive units will decrease in utility, and the last unit, the one which influences the purchase price, will always be the unit with the least utility. Not so with the total demand, as the two curves in Fig. 8 show. It might be said that the unit with the least value of any determined the value of every unit in the supply. Marginal valuation determines the value just as marginal utility does the utility of units of a stock. But the marginal valuation is not determined by the marginal utility of the supply but by the marginal utility of the part of the supply bought by the marginal buyer or marginal group of buyers.

The Familiar Law of Demand Explained.

These two forces—the desire for commodities and the desire for money or dislike of parting with money—working through individual purchases determine the demand for all commodities in the marts of the world. Operating in the manner which we have described, they fully account for the familiar and universal

fact that the higher the price the smaller the amount that will be bought, or the larger the quantity to be bought the smaller will be the price paid for it. Among the prospective buyers of any commodity are some who desire it more than others and some to whom the utility of money is greater than it is to others. The rich and those who are particularly fond of the commodity represented, in our case above, by A and B will purchase a limited supply at a high price, and at a lower price some of these will extend their purchases. As the price falls, new buyers will enter the market who are less fond of the commodity or who could not afford to purchase at the higher prices, causing a larger and larger supply to be bought.

The demand price is determined by the buyer or group of buyers at the margin. The actual selling price, in so far as it is influenced by the buyers, is determined by the less eager or poorer buyers to whom the price of the article is a consideration.

The Estimation of Demand.

Now that we have traced the action of the fundamental forces underlying demand, we will notice briefly some of the factors that influence these. The estimation of demand plays an important part in modern business. A knowledge of the conditions of demand, of the number of possible buyers, their purchasing power, their likes and dislikes is extremely valuable to those who have products to sell. While it would be impossible to refer to all those factors that must be taken into consideration by business men in estimating the demand for their products, among the more important are population, percentage of rural or urban residents, age, sex, occupation, number of families, number of wholesalers or retailers, local peculiarities, climate, custom, class, tastes, and income.

While the demand for some commodities, such as the commoner kinds of food, clothing, soap, and so on, depends, to a great extent, on mere numbers, that for most things are influenced by the character of the population of a district or country. The demand for toys depends on the number of children; that for sporting goods, on the number of youths and outdoor lovers. Sex is an important factor in the case of clothes, perfumes, hair nets, and safety razors. Occupation is the limiting factor in

many articles. A plough or tractor manufacturer is interested in the number of farmers; a saw manufacturer, in the number of carpenters, plus, perhaps, the number of home owners, as the recent advertising of the Disston Company suggests. The rural or urban percentage of a population affects the demand for those commodities sold chiefly to country people or to city dwellers. It is often important to take note of local peculiarities, such as the demand for stogies in Pittsburgh, snuff in the South, or the preference for whitewash to paint in some central Pennsylvania counties. Climate limits the demand for some things as to both time and place; there is little call for straw hats in winter or for fur coats in summer. The demand for lightweight clothing and porch furniture is heavier in summer than in winter, heavier in California than in Maine. The sale of other things is confined to certain classes and depends on social tastes. Such is the case with silk hats, walking sticks, and Tuxedos. Last but not least comes income. An article that appeals to the rich will command both a higher price and a more restricted sale than one used by the masses. The wealthy buy more expensive foods, clothing, furniture, and automobiles than the poor. But, on the other hand, a commodity like the Ford car that is within the reach of the lower ranges of income has a tremendously larger stretch of demand than the Rolls-Royce type of car, which is limited in its demand to the rich. Income statistics are highly suggestive along this line. The following table, taken from the figures compiled by the Commissioner of Internal Revenue from the income-tax returns for the years 1921 to 1927, indicates the rapid shrinkage in the number of prospects for commodities that depend on the patronage of the rich.

The estimation of demand is becoming today a matter of scientific investigation. In the market place as in the factory, guesswork is being displaced by accurate information obtained by a scientific analysis of the conditions of demand. Large use is made of statistics either compiled from special market investigations or obtained from governmental or trade agencies. Valuable statistics are furnished by many federal and state departments; the Bureau of Labor Statistics, especially, furnishes a variety of statistical data bearing on markets and prices that are invaluable to all who have products to sell. First-hand in-

NUMBER OF INDIVIDUAL RETURNS BY INCOME CLASSES FOR YEARS 1921–1927

Income classes	1921	1922	1923	1924	1925	1926	1927
Under $1,000	401,849	402,076	368,502	344,876	98,178	119,513	3,234,877
$1,000–$2,000	2,440,544	2,471,181	2,523,150	2,413,881	1,071,992	1,045,519	
$2,000–$3,000	2,222,031	2,129,898	2,472,641	2,112,993	842,528	837,792	
$3,000–$5,000	1,072,146	1,190,115	1,719,625	1,800,900	1,327,683	1,240,400	
$5,000–$10,000	353,247	391,373	387,842	437,330	503,652	560,549	543,509
$10,000–$25,000	132,344	151,329	170,095	191,216	236,779	246,730	250,455
$25,000–$50,000	28,946	35,478	39,832	47,061	59,721	57,487	59,874
$50,000–$100,000	8,717	12,000	12,452	15,816	20,958	20,520	22,460
$100,000–$150,000	1,367	2,171	2,339	3,065	4,759	4,724	5,240
$150,000–$300,000	739	1,323	1,301	1,876	3,223	3,267	3,854
$300,000–$500,000	162	309	327	457	892	892	1,135
$500,000–$1,000,000	63	161	141	242	479	468	555
$1,000,000 and over	21	67	74	75	207	231	283
Total	6,662,176	6,787,481	7,698,321	7,369,788	4,171,051	4,138,092	4,122,242

formation from dealers and users of products is secured through salesmen and by means of questionnaires sent to the trade. The leading advertising agencies and the sales organizations of the larger concerns maintain research departments which conduct sales surveys. Market analysis is a science in itself. As a result, weak spots in sales may be detected and their remedies suggested. Sales standards based on actual market conditions instead of on past performance may be established for classes of consumers and territories. New products need no longer be launched in the dark. Basic data are provided for the direction of sales and advertising campaigns. Improvements are suggested in products, new uses and, therefore, wider markets discovered, and production generally better adjusted to demand.

The Creation of Demand.

Business men today are by no means satisfied to take demand as they find it but deliberately plan to create it. Consumer wants are directed and stimulated on a large scale by personal salesmanship and advertising. Merchants and manufacturers do not wait for customers to come to them but, instead, take the initiative, seek the consumer, and sell to him. It is hardly an exaggeration to say that the majority of commodities and services marketed, from cash registers to insurance, are sold not bought; they never would be marketed were it not for the

aggressive tactics of the sellers. Fully half of the insurance policies sold in the last twenty years would not have been written had not the desire to purchase protection been deliberately created in the minds of husbands and fathers by the persuasive eloquence of life-insurance salesmen. Such concerns as the National Cash Register Company, the Burroughs Adding Machine Company, the Alexander Hamilton Institute would never have built up the business they have in the time they have had they waited for customers to come in and buy. They foresaw a need, produced a product to meet it, and then organized and sent out a force of trained salesmen to sell their products. These concerns have relied primarily on personal salesmanship supplemented later by advertising to build up the demand for their products. Now, the essence of salesmanship is the creation of the desire to buy in the mind of the prospect. The difference between an "order taker" and a "salesman" is that the order taker simply gives the buyer what he asks for, whereas the salesman creates the desire to buy on the part of the prospect in whose mind no such desire previously existed. This is truly termed in sales parlance "*creative* selling." From the viewpoint of economics, what is created is a demand for a product. Salesmanship is an art requiring considerable ability. Much attention is paid by business concerns in the selection of their salesmen and in training them.

Personal salesmanship has its limitations; one salesman is able to call on only a limited number of prospects a day, whereas by means of printed matter the product can be brought to the attention of millions. The use of advertising as a means of creating and stimulating demand on a large scale is of very recent origin. Its growth in the last twenty years has been remarkable. Today, it is the most powerful marketing force employed to sell commodities. Its phenomenal growth may be attributed to several causes; first, contrary to the belief of many, it tends to reduce the cost of production—both the manufacturing cost and the selling cost. By virtue of its ability to create demand on a large scale, it secures volume production, and this lowers factory costs. Though the advertising appropriations of many concerns may run into millions a year, the percentage of advertising cost to sales is remarkably low (ranging from a

fraction of one sixty-sixth of 1 per cent, for example, in the case of the California Fruit Growers' Exchange, to 7 per cent or 8 per cent for some of the smaller or higher-cost concerns). It is usually a cheaper method of marketing than personal salesmanship. William R. Bassett, President of Miller, Franklin, Bassett & Company, writing in *Printers' Ink* of Apr. 20, 1922, cites the following case from his own experience:

The item sold at		$100
Manufacturing cost	$40	
Selling cost using expensive specialty salesmen	45	85
Profit		$15
Profit on sales		15 per cent

Under a changed policy, the advertising appropriation was greatly increased, but the sales were easily closed by mail:

Selling price		$60
Cost to make	$40	
Cost to sell	10	50
Profit		$10
Profit on sales		16 per cent

The sales volume in dollars increased 44 per cent. The reduced selling price was the sales argument. It not only made the product easier to sell to the old market, but also, at the low price new buying strata were reached.

But the real secret of the power of advertising as a marketing force lies in the rapidity with which it works. Time is money in modern business. Advertising speeds up demand. Business men are not satisfied to let the demand for their products grow up as of old naturally by itself. Through the use of newspapers, magazines, car cards, electric signs, and the mails, they influence the minds of millions simultaneously. The rapidity and extent to which the tastes of a nation are subject to stimulation and direction by advertising is little short of marvelous. A nation-wide demand is created for a new product in a surprisingly brief time. The automobile furnishes a good example. The remarkably rapid growth of this industry is due largely to the fact that

it has employed advertising on an extensive scale to market its product. In 1899, there were but 3,700 cars manufactured; in 1928, the number of cars in use was estimated at 24,000,000, or about one car for every five people.

Some of the latest achievements of advertising have been in connection with fruits. The California Association Raisin Company hit on the happy idea of a nickel package of Sun Maid raisins. The first package was put on the market accompanied by a barrage of advertising Sept. 1, 1921; by Oct. 1, orders were received for 300,000,000 packages. Up to April, 1922, over 17,000 tons of Sun Maid raisins had been sold in nickel packets. The consumption of raisins has been doubled in the last five years mainly by advertising; the consumption in 1921 equaled 200,000 tons. In an address before the convention of Associated Advertising Clubs of the World at San Francisco, in July, 1918, Don Francisco, Advertising Manager of the California Fruit Growers' Exchange, stated that in the ten years since the orange growers have been advertising, the consumption of California oranges in the United States and Canada has increased from 10,000,000 to 18,000,000 boxes a year, or an increase in consumption of 80 per cent—a rate of increase four times that of population. In 1925, 29,000,000 boxes were sold.

An excellent example of the difference between the old and the new methods of building up a market is seen in the case of the Lambert Pharmacal Company, manufacturers of Listerine. This business was established in St. Louis in 1879 by the present Mr. Lambert's father, a chemist. Listerine was what is known as an "ethical product" in the medical profession. That is to say, the maker did not push its sale directly to the public but relied on the recommendations of physicians. A change came in 1921 when the Lambert Company decided to become a large advertiser. One of the sons, Gerard B. Lambert, who had great faith in the potency of advertising, made this novel proposition to the company: "Allow me to add $5,000 each month to our advertising appropriation as long as we remain in the black on that expenditure. Cut out the plan if I fail to make a profit in any month." The proposition was accepted, and in November, 1921, the company's advertising appropriation was $11,000. By November, 1927, the company's monthly advertising expendi-

ture had reached $400,000 and for the entire year was over $4,000,000. During this period, the net profits of the company increased from $115,000 in 1921 to over $4,000,000 in 1927. Later, this company applied the same plan to a new toothpaste which it wished to market. Gerard B. Lambert, now president of the Company, states:

> We consider our success with our toothpaste as being even greater than we had with Listerine. Listerine had many years of prestige and the backing of countless medical men; when we started advertising, our toothpaste was new. It was born in a highly competitive market. It had to retail at a much lower price than that of most of our competitors. This meant a far smaller margin of profit for us. When those facts are considered and when it is remembered that today Listerine sells more tubes of toothpaste than any other manufacturer, with one exception, I think we will be granted the right to believe that our toothpaste is even a greater success than Listerine and that our policy of advertising ran it up to its high position. Today the *net profits* on our toothpaste alone are many times greater than the net profits on our entire business in 1920.[1]

Another feature of advertising which has no doubt contributed to its growth is the control that it gives the manufacturer marketing through middlemen, over the ultimate demand for his product. Hitherto, the manufacturer depended on the wholesaler or retailer or both to push his commodity. If they failed to do so, he had little recourse. By packaging and branding his product and advertising it directly to the consumer, he is able to control demand at its source. The retailer is anxious to stock the advertised article because it is demanded by his customers; the wholesaler likewise, on account of the retailer demand. Thus, by reaching over the heads of the middlemen to the ultimate consumer, the manufacturer is no longer at the mercy of the middleman but is able to maintain a measure of control over the demand for his product even after it has left his possession. He is also able to cooperate better with the wholesaler and retailer and aid them in increasing their sales.

Advertising has been accused of increasing the cost of living. In one sense, this may be true; in another, it is not. When it is inferred, as it often is, that advertising by adding to the cost

[1] *Printers' Ink*, Nov. 10, 1927.

increases the price of commodities to the consumer, the inference is erroneous, as we have seen. It has also been asserted that advertising increases the cost of living by overstimulating desire, especially the desire for luxuries. There is no doubt, of course, that advertising does stimulate wants and wants for things people could do without, but whether it overstimulates wants is a question. Advertising is simply a method of selling, of persuading a buyer to buy, and selling has never been condemned. It cannot be accused of *unduly* influencing the mind of the buyer or using mental "strangle holds" to force buyers to buy, as is sometimes done in personal salesmanship when "strong-arm" methods are used. It employs much milder methods if more subtle and relies on the law of averages in reaching large numbers rather than on force. By making things known to large masses of people, by bringing things to their attention in an attractive manner, by making plain the service that they are able to render, by emphasizing quality, advertising naturally leads people to want these things. It is true, this is all carried out in a very scientific manner. Advertisers are practical psychologists; their copy is not prepared blindly. Human instincts are studied and the appeal is designed and aimed to reach the buyer's heart. They use science rather than force, but there is no sin in science.

There is nothing inherently wrong in creating a want for a thing unless that thing is bad, in which case it should not be sold by any method. In this respect, it must be admitted that advertising has pretty well cleaned house. Most of the leading papers and magazines exercise a rigid censorship over their advertising columns. Fake and injurious articles are fairly well excluded. Then, too, the increasing confidence of the public in advertised articles is based on good business grounds. It does not pay to spend money in advertising a commodity that is not what it is claimed to be. Repeat sales would not be made, and no matter how much money were spent to advertise it, permanent sales could not be maintained. The first requisite for any commodity to be permanently advertised is genuine utility.

It may be true that we are living today at a pace too fast; that advertising, city life, and other factors tend to overstimu-

late our wants, to render us too ambitious. One thing even here should be noticed in respect to the part which advertising plays in this tendency: While it is true that people's wants are stimulated by it, that it tempts them to spend, it also urges them to save. Some of the heaviest advertisers today are the banks and insurance companies which are persuading people to save and invest in their future. Likewise, our educational institutions are inciting men to invest their income in their education. And while it is true that advertising does deter us from spending the whole dollar on bread for our bodies, in tempting us to buy some hyacinths for our souls that may not be entirely an evil. Most assuredly, advertising has played a powerful part in raising the standard of living of the masses. It has hastened the introduction of new inventions and improvements to the nation at large. It has helped equip the factory and office with labor-saving machinery and furnished the homes of millions with comforts and conveniences. Steam shovels, typewriters, telautographs, telephones, bathtubs, open plumbing, phonographs, automobiles, radio sets all have been helped into common use by advertising.

Installment Selling.

Another factor which in recent years has come to play a conspicuous part in demand creation is installment selling. The purpose of installment selling is to convert future earning power into present purchasing power. It is a device by means of which the consumer is first placed in possession of the desired article and then encouraged to lay aside a certain stipulated amount to pay for it. It has not only extended the consumer market but has proved an effective means of selling to that market. Although installment selling is an ancient practice, it is only within the last few years that it has come to assume the prominent position which it now occupies in American marketing. For years, it was limited to a few lines such as homes, furniture, and pianos, but quite recently its use has rapidly spread to other articles. Its success as a sales device was first demonstrated in the automotive industry, where it was introduced about 1915. Before 1919, most automobiles were sold on a cash basis. Today, it is estimated, 60 to 75 per cent of cars are sold on the install-

ment plan. The chief classes of goods in which installment selling has come to play a prominent part are automobiles; furniture; pianos; sewing machines; phonographs; washing machines; radios; jewelry; clothing; tractors; gas stoves; electric refrigerators; vacuum cleaners; and farm equipment. It is estimated that 19 per cent of furniture is sold on the installment plan, 25 per cent of all jewelry, and 85 per cent of phonographs, washing machines, vacuum cleaners, and radios.

According to an investigation made by M. V. Ayres for the American Bankers Association, the most rapid period of growth for installment selling was from 1920 to 1923. His report shows that at the end of 1925, the total amount of merchandise installment debt outstanding was $2,744,000,000, which is an increase of only 7 per cent over 1923. Professor E. R. Seligman, who has recently completed a very thorough study of this new form of consumer credit, estimates that in 1926, installment sales totaled about $6,000,000,000 and that the total credit outstanding at any one time was about $2,750,000.000.[1] About $4,000,000,000 of the total sales were of durable consumption goods and constituted about 12 per cent of all retail sales, which were approximately $38,000,000,000. The cost of installment selling has been estimated to range between 11 and 40 per cent. In the automotive industry, it runs from 11 to 23 per cent and is said to average about 14 per cent. The cost is, however, being reduced by more careful granting of credit and better methods of financing employed by the finance companies which are now operating in this field. In 1926, there were over 800 finance companies, many of which also finance other kinds of merchandise, engaged in financing motor vehicles. John J. Raskob, chairman of the Finance Committee of the General Motors Corporation, states that the General Motors Acceptance Corporation, from its inception in 1919 to Oct. 1, 1926 purchased $819,203,000 of consumer obligations and that the credit loss to Oct. 1 aggregated $1,117,706, or only about one-seventh of 1 per cent.

There is a wide divergence of opinion on the part of both business men and economists as to the economic effects of installment selling. It is claimed, on the one hand, that it tempts consumers to spend beyond their means; that it encourages the

[2] SELIGMAN, E. R. A., "The Economics of Installment Selling."

purchase of luxuries and lessens savings; that it increases the cost of living; and endangers the credit system of the country. On the other hand, those who favor it say that it raises the standard of living by enabling many people to enjoy goods which they would be unable to secure had they to pay cash; that it serves as an incentive to work and thus increases the productivity of labor; that it inculcates habits of systematic saving and budgeting of expenditure; that it reduces the price of commodities by increasing the demand for those articles made under the law of decreasing cost, as for example, automobiles. There is no doubt but that installment selling has its dangers and that these should be safeguarded; there is little doubt, also, but that it has come to occupy a permanent place in the marketing of many commodities. Installment selling is based on an extension of consumer credit greater than has been customary in the past. This is due to the increase in durable consumption goods which have been placed at the command of the masses in recent years. The time element has increased in consumption as well as in production. And just as in the past producer credit has played an important part in production, consumer credit is coming to play an increasingly important part in consumption and as a factor in extending the market for consumption goods. There is nothing inherently uneconomic in consumer credit; and installment selling, provided it is based on credit soundly administered and confined to durable consumption goods in which the buyer has sufficient equity over the period of purchase, will continue its course as a modern method of demand creation.

Summary.

By demand is meant the largest amount that will be bought at a given price or the highest price that will be paid for a given amount. The point of our inquiry has been to discover what determines this amount or price and how it is determined.

As the total demand is made up of individual demands, we first found what decided the purchase of the lone buyer: the desire for the commodity and the desire for money or, objectively speaking, commodity utility and money utility.

These two forces operate by means of a comparison in the buyer's mind between the marginal utility of the amount which

he contemplates purchasing and the utility of the money which he expects to pay for it.

We next saw how the individual buyers made up the total demand. We found that the total demand was determined by the group of buyers at the margin, or, to be exact, the marginal buyer—that the highest price that a given amount would be bought at is determined by the price which the group of buyers at the margin, or, to be accurate, the marginal buyer, will pay.

We may say, therefore, that the highest price that will be paid for a given amount or the largest amount that will be purchased at a given price is determined by the comparison made by the marginal buyer between the marginal utility of the last part of the supply he purchases and the utility of money to him.

The practical importance of the two forces determining demand is well illustrated by modern sales practice and, in particular, by the tremendous scope of present-day advertising.

Test Questions

1. How does the utility of money vary with different individuals?
2. Explain how a decrease to an individual in the utility of money will increase his demand.
3. What two ideas in the mind of the buyer determine his demand?
4. Explain how the market demand for a commodity is made up of individual demands.
5. What buyer determines the market demand under conditions of free competition?
6. What are the two forces determining the prices of commodities under the action of the law of supply and demand?

References

CAIRNES, J. E., "Character and Logical Method Method of Political Economy," Chap. I.

CARVER, T. N., "Distribution of Wealth," Chap. I; "Principles of Political Economy," Chap. XXII.

CLAY, H., "Economics for the General Reader," Chap. XV.

ELY, R. T., "Outlines of Economics," Part II, Chap. X.

HADLEY, A. T., "Economics," Chap. III.

HOLLINGWORTH, H. L., "Advertising and Selling."

KITSON, H. D., "The Mind of the Buyer."

MARSHALL, A., "Principles of Economics," Book III.

MILL, J. S., "Principles of Political Economy," Book III, Chaps. I, II.

MITCHELL, W. C., "The Backward Art of Spending Money."
NICHOLSON, J. S., "Political Economy," Chap. III.
PANTALEONI, M., "Pure Economics," Part II, Chaps. I–III, 1898.
SCOTT, W. D., "The Psychology of Advertising"; "Theory and Practice of Advertising."
SEAGER, H. R., "Principles of Economics," Chaps. V, VI.
SEDGWICK, H., "Principles," Book II, Chap. II.
SELIGMAN, E. R. A., "Principles of Economics," Part III, Chaps. XV–XVII.
TAUSSIG, F. W., "Principles of Economics," Chaps. VIII, IX.
TIPPER and others, "Principles of Advertising."
WALKER, F. A., "Political Economy," Part III, Chap. I.
WHITEHEAD, H., "Principles of Salesmanship."
WICKSTEED, P. H., "The Common Sense of Political Economy," Book II, Chaps. I–III.
WIESER, F. VON, "Natural Value," Book II, Chaps. I–4.

CHAPTER XV

THE FORCES BEHIND SUPPLY; COST OF PRODUCTION

THE QUESTION OF SUPPLY

Having uncovered the forces influencing prices on the buyers' side of the market and noticed their *modus operandi* in determining demand, we will now consider the domain of the seller. Postwar high prices provoked a lively speculation on the part of the public as to their causes and justification. The man who paid $10 for a pair of shoes that before the war could have been bought for $5 or 50 cents for two collars that formerly cost him 25 cents, though aware of the increased cost of production to the maker, was apt to suspect that part of the high prices might be due to someone pocketing abnormal profits. He may even have been tempted to wonder sometimes whether or not there was any limit to the price which the seller was able to charge. Governmental price fixing of commodities during the war has led to a new interest in the question, What is a fair and just price? All of which has kindled in the public mind an active curiosity as to the nature of the sellers' influence over prices and a desire for more light on what takes place in the private office of the manufacturer and merchant when prices are under consideration. The question is, What determines the prices which sellers charge for given quantities of a commodity or the quantities which they will be willing to sell at given prices?

The Determinants of Supply.

The total supply of a commodity, like the total demand, is the sum total of the individual supplies. If the supply schedule indicates that a million units will be offered for sale at a price of $1, it signifies that competing sellers of the commodity are together ready to supply that amount at that price.

The lowest price at which any individual producer will be willing to offer any given amount of a commodity will be determined by his comparison between the disutility, or cost of his product, and the utility of the money price which he expects to receive. This is the principle governing the selling price of the individual, and the two forces involved are desire and cost —desire for the money price, and the cost which must be incurred in the production of the commodity. Just as the buyer compares the utility of the commodity he is about to purchose with the utility of something else costing the same amount, so the seller compares the cost of producing the commodity with the utility of the money return he expects to receive. Both seek a gain in the transaction—the buyer in the excess of the commodity utility he receives over that of the money payment he makes; the seller in the excess of money utility he can obtain over the cost of production. The price the buyer is willing to pay represents the utility of the commodity in terms of money; the price the seller is willing to take represents the cost of production in terms of money.

As cost of production is the chief factor limiting the supply of freely reproducible commodities sold by competitive producers, the point of our inquiry will be to trace its influence on supply prices and amounts. Before doing so, however, we will look a little closer at this force which plays such an important part in modern industry.

The Meanings of "Cost."

Cost is a term possessed of a dual personality. In political economy, it stands for the efforts, sacrifices, and risks incurred by producers in the production of commodities. It is the exact opposite of utility, which refers to the satisfaction to be obtained from the products of industry. Hence, the word "disutility" is often used in place of cost. Cost represents the unpleasant in production; utility, the pleasure embodied in the fruits of that unpleasantness.

But in the vocabulary of commerce, cost stands for the money expenses incurred by entrepreneurs. To a business man, "cost" means the money outlay required for the production of his product; this plus his profit constitutes his selling price.

All the money expenses of production, including the profit of the entrepreneur, are termed in political economy either "money costs" or "expenses."

To avoid confusion, we will use the term "real cost" when referring to the efforts, sacrifices, and risks involved in production; "money cost" when referring to the money expenses; while "cost" will be used in its usual commercial sense, as the money expenditure of the individual business concern.

Real Cost and Supply Price under Simplest Conditions.

In the case of an individual producing a commodity entirely by himself for sale, the price in expectation of which he would be willing to undertake the work must repay him for the efforts, sacrifices, and risks that he undergoes. A case in point would be the building of a log cabin in the woods, for a summer visitor, by a frontiersman who obtains all his materials from the forest and performs all the work himself. The lowest price for which he would be willing to build the cabin must be equal in his mind to the trouble he incurs, or he would not tackle the job. A fair and reasonable price would be one that would amply remunerate him for all the efforts, sacrifices, and risks that he had incurred in the course of the undertaking.

Complex Nature of Real Cost in Modern Production.

But commodities today are brought into existence by the cooperative action of various kinds of laborers, capitalists, and entrepreneurs, each contributing his specialized quota, as the raw materials flowing through the channels of production are by consecutive processes transformed into finished products. The real cost of a finished product is, therefore, the sum total of the efforts, sacrifices, and risks incurred by all those who have contributed in these various ways to its production and is even, in the case of the most simple commodity, a very complex thing.

Consider, for a moment, the varied expenditure of human effort involved in the making of a pair of shoes; beginning with the work done by the producers of the raw materials, the ranchmen and their cow punchers on the plains, the darkies in the cotton fields, the miner drilling in the bowels of the earth, the packers and their men in Chicago, the tanners engaged in their

odoriferous tasks, the operatives working 8 or 9 hours a day in the noisy textile mills, the shoe manufacturer with his salesmen, clerks, and factory hands, and, lastly, the only one with whom we are brought into contact, the retailer who sold them to us. Add to these the labors of the miscellaneous army of supplementary workers, such as the makers of the machinery and equipment used, those engaged in transporting these various products—the railroad men on land, the sailors on the sea, the capitalists and bankers who have supplied the capital—and we have a partial conception of the accumulation of human toil that enters into the real cost of a pair of shoes.

How Real Cost is Converted into Money Cost.

The real costs of production are continually being converted into money costs, as the raw materials travel along the channels of production toward the ultimate consumer. All along the route as each producer does his bit, he receives a money payment in return for the part which he has played in production. The money cost of a finished product is the sum total of the money payments made to all those who directly or indirectly have aided in its production. Just as the real cost of any finished product is the sum total of the efforts, sacrifices, and risks incurred during the course of its production, so its money cost is the sum total of the money expenses that have been assessed against it from its inception.

At any stage in the production of a commodity, the selling price sums up the money costs chargeable to that particular commodity up to that time, plus the seller's profit. A manufacturer's selling price of shoes, for instance, is determined by his cost of production, plus his profit. This cost consists of money payments for materials, machinery, labor, etc. To this money outlay he adds a sum sufficient to remunerate himself for his own trouble and risk. What he pays in wages rewards those who have labored with him. What he pays for raw materials and machinery covers the cost of their production, out of the price he pays for leather; the tanner, likewise, is repaid for his money outlays and receives a profit, while he, in turn, in the price he pays for hides reimburses the packer and his men.

The price the retailer pays for shoes covers all the money

costs incurred by previous entrepreneurs from the producers of the raw materials to the shoe manufacturer; to this the retailer adds his own cost, which, plus his profit, constitutes his selling price. And the price to the ultimate consumer includes all the money costs assignable to the commodity in the course of its production.

Money Cost and Supply Price.

Money costs are the payments necessary to induce the various producers to contribute their shares to production. We may divide the producers into laborers, capitalists, and entrepreneurs and look upon the money costs as the payments that must be made to these agents of production to induce them to furnish the requisite quantities of labor, capital, and organization. In this case, the money costs are the supply prices of the quantities of the factors of production, and the supply price of the finished product is the sum total of the supply prices of the factors of production that have been demanded to bring it into being.

We thus see how, in the devious course of modern production, real cost crystallizes into money cost and money cost, by a process of aggregation, builds up the supply price of the finished product. Thus, in this indirect and roundabout way, the supply price of a finished product is that which has been necessary to induce those who have been instrumental in its production to play their part.

Relation of Real Cost to Supply Price of Land.

In our account of the evolution of real cost into supply price. we omitted, in speaking of the supply prices of the factors of production, any mention of the supply price of land or natural products. Rent is an important item in the costs of business men; and in so far as commercial rent is due to improvements on land or natural resources, real cost enters into it and influences the supply price of this factor. It enters it, however, in the form of labor, capital, or organization and should be credited to these agents of production.

Rent from the viewpoint of political economy, however, is the return paid to owners of land for the part which their land,

strictly as a natural product, plays in production. Now, the land in the United States or the coal or iron lying beneath that land is certainly not the fruits of man's labor, and its supply, therefore, is not influenced by real cost. The supply of land is limited, in the first place, by nature and is further limited and controlled so far as its productive use is concerned by private ownership. The supply price of the factor land, then, is not the sum necessary to induce owners of land or natural resources to put forth any production effort but to induce them as owners to allow their land to be used for production purposes.

Cost of Production.

The supply of produced commodities today is *directly* regulated by entrepreneurs, be they sole proprietors, partnerships, or corporations; and they reckon their costs in terms of money. These decide what shall be made and how, coordinate the other agents of production, pay them for their services, assume the responsibility of marketing the product, and decide on the price. Their costs are the sums which they pay to the other agents of production; these, plus their profits, constitute their selling price.

The modern business concern is confronted with no more difficult task than to determine accurately its cost of production. The way commodities are fashioned today by the thousand, in complex organizations of highly specialized workers and machines, arranged in departments, each performing its particular function, makes the finding of unit costs a problem of no mean order. It is scarcely to be wondered at that up to a few years ago the great majority of concerns preferred to guess at their costs, a practice by no means extinct. Keen competition, however, and the splendid work carried on just previous to America's entrance into the war by the Federal Trade Commission under the Hon. E. N. Hurley in reference to cost finding, followed by the requirements of the government during the war, including, also, the income tax, have worked a revolution in the field of costs. Guesswork is being replaced by accurate knowledge, and more than one concern has discovered to its surprise that it has been selling one or more of its products actually at a loss. Many of the best brains in business have been engaged on cost problems, the universities throughout the country have cooperated,

with the result that a science of cost accounting has been developed and a goodly number of trained cost men are being prepared in our university schools of commerce every year for this important branch of work. Now that war is over and the nation is entering on a new era of intense international competition, less than ever can business men afford to play blindman's buff with their costs.

A Simple Analysis of Manufacturing Cost.

What constitutes cost may, perhaps, be best illustrated by a brief survey of manufacturing costs, in which field cost finding has been carried to its highest degree of efficiency. The Federal Trade Commission, as a result of its exhaustive research and study of the cost of production of a large number and variety of businesses, presents, in *Document* 1356, entitled "Fundamentals of a Cost System for Manufacturers," a simple yet complete analysis of manufacturer's costs.

The three elements of cost are *material, labor,* and *overhead expense.* The first two of these are divided into direct and indirect.

Direct material is that which forms part of some particular job or which can be charged directly to a unit of product. Indirect material is that which cannot be located as belonging to any job or unit.

Direct labor is that which is applied directly to a particular job or unit of product. Indirect labor is that which cannot be located as belonging to any particular job or unit, as the labor of a works manager or superintendent of foremen.

Direct material and direct labor constitute what is generally known as *direct* or *primary cost* and shows the actual amount of cost directly chargeable to a particular job or unit of product.

Overhead expense is expense of every kind connected with the business, none of which can be located as belonging to a particular job or unit. These expenses, while part of the cost, are general and, therefore, cannot reach the job or unit directly; hence a method must be devised for them to reach the cost sheet indirectly and in such a manner that each job or unit will receive its fair proportion of the total. For this reason, overhead expense is sometimes termed "indirect cost."

Overhead expense is divided into two classes, *factory overhead,* which consists of items directly belonging to factory production, and *general overhead,* which is expense not directly connected with the factory.

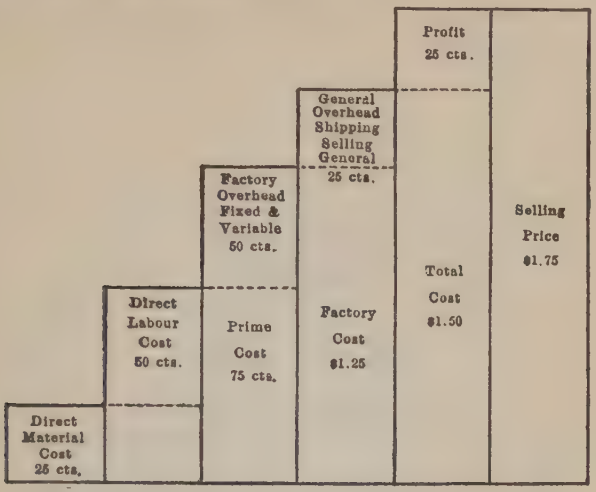


FIG. 9.

Factory overhead is split into two parts, *fixed* and *variable* charges. Fixed charges consist of building expense or rent, power, insurance, taxes, and depreciation; variable charges, the controllable expenses of factory operation, complete factory overhead, and such items as indirect labor, repairs, lubricating oils, and miscellaneous supplies.

Direct cost plus factory overhead constitute what is usually termed *factory cost.*

The next step, now that the goods are completed and placed in the storeroom as finished goods, is to compute their share of *general overhead,* which consists of the shipping, selling, and *general expenses* of the business.

Shipping expense includes a proportion of fixed charges, freight or drayage, shipping clerks' wages, supplies, and incidental expense items.

Selling expense involves such items as salaries and expenses of sales force on the road and in the office, advertising, catalogues, cost of handling canceled orders, etc.

Last but not least come *general expenses,* such as officers' salaries, office expenses, insurance, defective work, taxes, interest when charged, and other items of a general nature.

With the adding of general overhead to factory cost, the riddle is solved and *total cost* is found. This plus profit constitutes the *selling price.*

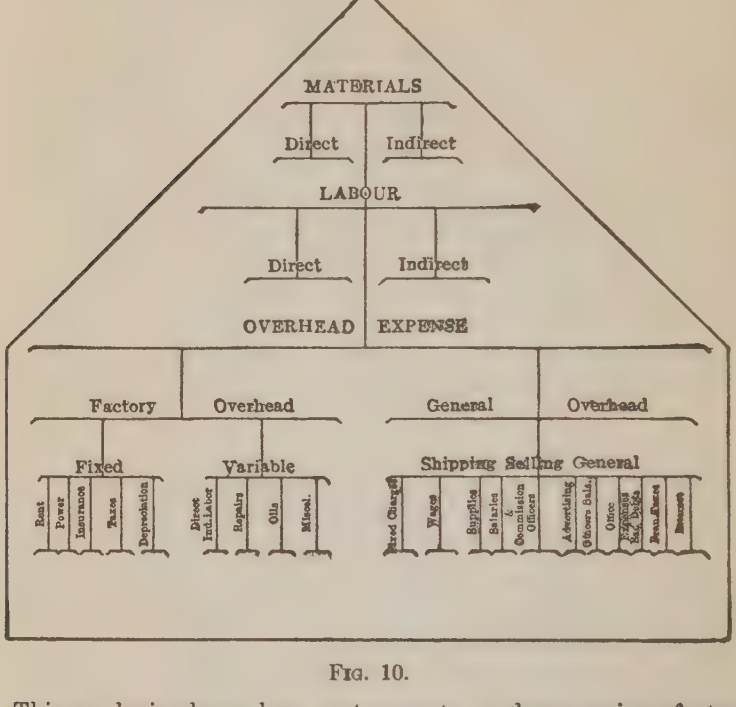


Fig. 10.

This analysis shows how cost mounts up by a series of steps to the selling price, and Fig. 9 illustrates the process. Figure 10 shows at a glance the three chief elements of cost with their divisions and subdivisions.

Joint Cost and Supply Price.

Many commodities are produced under conditions of joint cost; the productive process gives birth not merely to a single product, but to twin, triple, and, in some cases, a whole family of kindred products. These are often termed "joint products" and include by-products; familiar examples are sugar and

molasses; cotton and cotton seed; beef and hides, with their numerous retinue of by-products; coke and coal tar with its varied progeny; and a legion of others whose numbers are constantly being augmented by scientific research.

When two or more commodities are produced *entirely* under conditions of joint cost, such as sugar and molasses, both of which emerge from the same plant and neither can be said to possess a distinct supply price of its own, to neither is it possible to attribute a definite proportion of the common cost. They do have a collective supply price, the sum total of their joint costs; for less than this they will not continue to be produced. The actual price of each will depend on the condition of demand for each. A share of the joint cost may be assigned arbitrarily to each according to the judgment and interest of those concerned. One method of segregating the cost of a principal product from a by-product is given by the Tariff Commission in its report on the costs of production in the sugar industry.

> If for the marginal factory the total cost of producing both sugar and its by-products is $140 per ton of sugar produced, and the receipts for the by-products are $20 on every ton of sugar produced, then a price of $120 per ton would permit that factory to continue without loss, while all the lower cost producers would make a profit. In such a view of the case the cost of producing sugar may be said without any great impropriety to be $120 per ton.

In the case of two or more commodities produced *partly* under joint cost, but which incur special costs in the separate subsequent processes which each must undergo to arrive at completion, the price of each must at least cover its special cost. The joint cost will be assigned to one, or divided between them, as judgment dictates or demand decides.

When there is one principal product, and a number of by-products, it is a common practice, in determining the cost of the principal product, to deduct from the total cost the value of the by-products. The following description, by L. D. H. Weld of Swift & Co., of the packers' method of determining beef costs furnishes a good illustration:

> In the cattle operations of the packing industry, beef is the major product and has to be sold promptly, and consequently it is necessary for the packers to determine its cost. By-products include hides, oleo

oil, tallow, bones, etc. Only about 45 to 60 per cent of the live weight of cattle emerges as beef, but this is the most important single product, both in weight and more especially in value.

In figuring the cost of beef, the packers keep separate account for each lot of cattle handled. The cattle are bought in lots, and consequently the cost price of each lot of live animals is known. To this original cost are added the expenses of buying, killing, dressing, trimming, loading, etc., thus giving the total outlay on the lot. From this total outlay is subtracted the current market value of by-products (less expenses for preparation and marketing). The remainder represents the cost of the beef, at the packing plant, before the payment of freight and selling expenses, which are finally added in order to get the total cost. The total cost of the lot is divided by the total number of pounds of beef, in order to get the cost per pound.

This whole process is illustrated by the following figures, which apply to a representative lot of cattle, but at a time when by-product values were relatively low:

EXAMPLE OF COST FIGURING FOR LOT OF CATTLE

Live Cost: 46 head, weight 52,390 lb., avg. 1,138 lb., native steers, at $7	$3,667.30
Expenses: killing, dressing, chilling (estimated for month)	118.03
Allowance: condemnations, trimming, etc. (average)	17.77
Total outlay on lot	$3,803.10
Less: credit for hides (cured values less expenses of curing and marketing)	$387.06
Less: credit for fats (value of products less expenses)	116.30
Less: credit for other by-products (value of products less expenses of preparing)	125.73
Total by-products credits	$629.09
Balance: plant cost of carcasses (in cooler)	$3,174.01
Dressed carcasses weighed 29,615 lb., yield 56.53 per cent of beef.	
Average dressed cost per hundredweight	$10.72
Add selling costs and expenses	1.87
Total dressed cost of lot per hundredweight	$12.59

It should be noted in this example that whereas the live cattle, weighing 52,390 pounds, were bought for $7 per 100 pounds, only about 56 per cent of this live weight emerged as dressed beef. This is the principal reason why the cost per pound of dressed beef has to be so much higher than the cost per pound of live animals.

The accuracy of this method of figuring the cost of beef depends largely on the accuracy of the by-product values used. If less than market values were deducted, the cost of beef would be too high, and consequently the profit would appear too small. The packers explain that whatever values are used in determining costs, the selling price of beef is not affected, because fresh beef is a highly perishable product and must be sold promptly at the prevailing market price, but that in order to run their business properly, it is necessary to determine costs and profits for each department as exactly as possible.

The packers also call attention to one difficulty of this costing method. They have to use the *current* value of cured hides, for example, in determining the cost of beef at any one time, whereas it takes several weeks to cure the hides, and when they are finally sold, they may bring a higher or a lower price than had been figured on. Actual selling prices of hides and of by-products are used in figuring their earnings, but this does not affect the method of cost finding from day to day, because future values of by-products cannot possibly be estimated.

Summary.

Cost is the chief factor limiting the supply of freely reproducible commodities sold by competitive producers. In economics, the term "money cost" is used to denote the money expenses of production, and "real cost" refers to the effort or sacrifice involved. In industry, real cost is constantly being transposed into money cost. Money costs, in turn, make up the supply prices of commodities, and the price paid by the ultimate consumer includes all the money costs assignable to an article in the course of its production. Keen competition has forced business men to keep accurate track of their costs, and the science of accounting has been developed for that purpose. The three chief divisions of manufacturing cost are material, labor, and overhead expense. In the case of articles produced under joint costs, a share of the joint cost may be assigned arbitrarily to each, according to the judgement of those concerned.

Test Questions

1. What is the chief factor in determining supply?
2. What is meant by "real" cost; "money" cost?
3. Does "land" have any real cost?
4. Make an analysis showing the elements of manufacturing costs.
5. What is meant by "joint" cost?
6. Describe the method of costing used by the packers.

CHAPTER XVI

INFLUENCE OF COST ON SUPPLY

In the preceding chapter, we saw how in our complex industrial system real cost underlies the supply prices of commodities, influencing them indirectly through the supply price of the factors of production employed to bring them into being. We saw, also, that the supply was directly influenced by money cost, operating through the cost of production of entrepreneurs, an analysis of which we have presented. It is the entrepreneur who runs the supply train; it is his hand which is on the throttle. The amount which he will produce and the price at which he will be willing to sell will be determined directly by his cost of production. Our next step will be to see *how* the amount and the price of the supply are governed by cost. We will find that cost influences supply in three ways: (1) by increasing as the volume of production increases; (2) by decreasing; (3) by remaining constant.

Influence of Increasing Cost on Supply Price of Individual Producer.

In the case of an individual producing a commodity the unit cost of which increases with the amount which he produces, the price at which he will be willing to furnish any given quantity or the quantity which he will be willing to sell at any given price will be determined by the cost of the last, or marginal, unit.

If, for instance, additional units of a commodity are produced at the following cost:

The fifth at a cost of $1.00,
The tenth at a cost of $1.10,
The fifteenth at a cost of $1.25,
The twentieth at a cost of $1.50,

the largest amount that the producer will be willing to supply at a price of $1.10 will be ten. He makes a gain on each unit up to the tenth, the cost of which just equals the price he is offered. As every unit over this amount costs more than $1.10, he will not be willing to supply more than ten at that price. And so with any given price, he will be willing to continue production up to the point where the cost of the last unit equals the price.

In the same way, the price at which he would be willing to furnish any given amount would be determined by the cost of the last unit. He would not be willing to supply ten units for $1 a piece, as he would suffer a loss on each unit which he produced over the fifth; to induce him to supply ten, the price must be sufficient to cover the cost of the tenth unit.

The amounts of the supply schedule of an individual producing under the law of increasing cost would be the maximum amounts that he would offer at the given prices; and the prices, the minimum necessary to induce him to supply the given amounts.

Law of Increasing Cost or Diminishing Returns.

In agriculture and in the extractive industries, to a lesser degree, there is a tendency for commodities to be produced under the law of increasing cost. In the cultivation of a farm, for example, a point is reached where an increase in product is obtained only at a more than proportionate increase in cost. This tendency is sometimes referred to as the "law of diminishing returns" and may be stated as follows: In the cultivation of a given area of land or in the operation of a natural resource, after a certain point has been reached, increasing applications of labor and capital produce less than proportionate returns in product, provided no changes occur in the arts of production.

It is immaterial whether we refer to this law as the law of increasing cost or diminishing returns; it is evident that if the unit return diminishes in proportion to the unit cost, the cost increases in proportion to the return. Buried deep in the nature of things, this law has reigned in agriculture since the time of Adam, but to Ricardo is given the credit of its first formal statement.

Explanation of Law; Its Limitations.

In the earlier stages of the cultivation of a tract of land, increased applications of labor and capital, in the form of extra ploughing, harrowing, fertilizing, etc., may yield more than proportionate increases in product. After a time, however, extra doses of labor and capital will inevitably result in smaller and smaller returns, until the point is reached where the extra return is just about equal to the additional dose of labor and capital. This point has been termed the "margin of cultivation"; the last dose of labor and capital, the "marginal dose"; and the extra product just balancing it, the "marginal return."

We may state the same fact from the viewpoint of cost. Up to a certain point, additional units of a product may be secured at a decreasing cost; after the point of minimum cost has been passed, additional units can be obtained only at an increased cost; and the point will finally be reached where an additional unit will cost as much to produce as it will bring in the market. This marks the terminus of profitable production. We may speak of it as the "margin of production"; the last unit as the "marginal unit"; and its cost as "marginal cost."

Many rash and pessimistic predictions have been made from the time of Malthus to the present, by failure to realize the limitations of this law the practical importance of which lies largely in its influence on the food supply of man. While the population of a country is ever increasing, the amount of land from which foods can be procured is limited, and, if this law is true, as the population increases, it can be fed only at an increasing cost. This was the fact that lent color to the Malthusian theory which so strongly agitated the British in the nineteenth century. The little proviso at the end of this law is important: "If no changes occur in the arts of production" —if the knowledge and equipment of the cultivator remained stationary, then, indeed, there would be cause for alarm.

We live, however, in a world of change, and though agriculture did not awaken quite so soon as manufacturing to the power of the machine, or the magic of science, the last seventy years have witnessed a revolution in methods of providing men's tables with food. Better fertilizers, better methods of cultivation,

better grains and stock, through the efforts of Uncle Sam's scientists in the Department of Agriculture and of men like Luther Burbank; the rapid and widespread utilization of machinery, the latest example of which is the farm tractor of which 180,000 were in use in 1918, all have tended to counteract the law of increasing cost. It has even been claimed that they have nullified it. Such, however, is not the case, for this law is rooted in the very nature of the universe, and though it may be and has been offset by other laws, it still remains in operation, as very farmer knows. No matter how long improvements in the art of agriculture, due to invention and discovery, postpone the point of diminishing returns to any piece of land, there comes a time, if more product is demanded, when it must be produced under the law of increasing cost.

In considering the effect of this law on the food supply of any one country, we must take into account the development of land and marine transportation, which has opened up a way of escape to the world's seven densely populated centers of civilization from the otherwise inevitable action of this law in raising the cost of food. As any one country exhausts its fertile soils and gets into the condition of England in the early part of the nineteenth century, ocean transportation comes to the rescue, carrying food raised on the broad, fertile plains of distant lands, such as the Mississippi Valley, the Canadian Northwest, Australia, and the virgin plains on the banks of the LaPlata in Argentina. And who knows but that with the advance of aerial navigation, time and distance will be so commercially annihilated as to place the products of the most inaccessible places of the earth within a few hours' reach of the world's markets, enabling our future centers of dense population to be fed with bread raised in the rich valley bottoms and plains of South Africa and other now remote places.

Increasing Cost and Total Supply Price.

The total supply price of any commodity produced under conditions of increasing cost will be based on the marginal cost of the marginal producer, whose supply is just necessary to satisfy the existing demand.

The total supply is the sum total of the individual supplies.

Among the individual producers will be some less favorably situated than others, who, utilizing poorer land or forced to engage in more intensive cultivation, are producing at a higher cost; while others more fortunately situated are able to produce at a lower cost. A small amount might be supplied at a lower price, but if a larger quantity is demanded, the price must be sufficient to induce the high-cost producers to supply the necessary quantity. Those more fortunately situated will not sell at a lower price than their less fortunate competitors and so will reap a larger profit. The one price at which the whole will sell will be based on the costs of the marginal producers, just as the price at which the individual will be willing to sell is based on his marginal cost.

The sugar industry well illustrates the above principle. In the beet-sugar industry of continental United States, for instance, there are three well-defined areas of production, namely, the Pacific region with ten to thirteen factories in California and one in Oregon; the mountain region including twenty-nine to forty-two factories in Colorado, Utah, Montana, Wyoming, Kansas, Nebraska, Nevada and Arizona; and the eastern region with twenty-four to twenty-seven factories in states lying east of the Missouri River. The average costs of producing a ton of sugar for these areas in 1917 to 1919 were as follows:

Pacific, $96.64 per ton.
Mountain, $109.41 per ton.
Eastern, $135.20 per ton.

The lower cost of production for the Pacific region is due primarily to the favorable climatic and soil conditions in California. And it is evident that if the price of beet sugar in the United States were to be based on the cost of production in California, a large number of plants in the Mountain and Eastern regions would be forced to suspend operations.

In stating our theory of the supply price of a commodity produced under conditions of increasing cost, we maintained it to be based on marginal cost; in actual practice, however, it is likely to be based on the marginal cost of 90 per cent of the supply, as is shown by the chart facing p. 224 taken from the *Report* of the United States Tariff Commission on the costs of

production in the sugar industry, from which is also taken the following apt quotation bearing on this subject:

Sugar production, it thus appears, is essentially an agricultural industry. Because of the varying degrees of fertility of land and varying advantages of location with respect to market, costs are permanently higher in some regions, or on some sites, than in others. The land which is most fertile and most favorably located cannot supply the total quantity demanded. The price is high enough to make it pay to cultivate land less fertile or less favorably located. There are always producers of such a grade or in such a location that their profits are not more than average or normal, producers for whom production barely pays. These are the high-cost producers, called, for brevity, the marginal producers. The producers more advantageously situated continue to operate at low cost and receive the same price as the marginal producers; and they secure a larger profit. A study of the charts printed at the end of this report shows that in every locality and in every year the facts in the case of the sugar industry exemplify the results of the above analysis. There is a regular gradation of producers whose costs ascend like a flight of steps to the marginal producer. Further, there will always be in any given year a few producers who because of poor judgment, or drought, flood, fire, insect pests, or other misfortune will be shown as operating at a cost even higher than the marginal. Such a producer, for example, is obviously No. 68, Beet Sugar Industry, 1917–1918 (Chart 111). His cost is $406.37 per ton. The average price of sugar for that year was only $120.40 per ton. He suffered a severe loss and clearly would not continue in business permanently at the same cost. Economic forces are always tending to eliminate such producers as show, over a series of years, a cost above the marginal cost, but in any one year the vicissitudes of time and chance will throw a few individuals temporarily into this class. The class is permanent; the individuals in it change.

Influence of Decreasing Cost on Individual Supply Price.

Many commodities are produced under conditions directly opposite to those referred to above; instead of the unit cost increasing with an increase in the supply, it decreases. In this case, the unit price of any given amount will be based on the average cost to the producer, and the amount will be the smallest that the producer will offer at any given price.

As each of the preceding units have cost the producer more than the last, he will evidently be unwilling to sell them at a

price based on the cost of the last. If the cost of the one-thousandth unit was 50 cents and each of the previous units have cost more, to sell the whole supply at 50 cents would entail a loss on every unit but the last. The producer must at least be assured of getting back his total cost, so that the lowest price at which he will be willing to supply any given number of units will be based not on marginal but on average cost.

Another point of contrast between a supply produced under increasing and one produced under decreasing cost is that while the amounts of the former are maximum, those of the latter are minimum amounts. The price at which the sellers operating under decreasing cost will supply a given amount is based on the average cost of production for that amount. Now, as the average cost of a smaller quantity would be higher, he would not be willing to supply it at a price based on the cost of the larger quantity. At any given price, therefore, the amount is the minimum that will be supplied at that price; that amount or more will be offered. To sell merely the minimum at any given price just repays the bare cost of production, but to sell a larger quantity means an extra profit, and, moreover, the larger the amount the lower the cost and the bigger the profit. Here the way to fame and fortune lies along the great highway of large-scale production, and the individual producer labors under a powerful incentive to increase his sales, a fact the significance of which will appear later.

The supply schedule of a commodity produced under increasing cost is still further differentiated from one produced under decreasing cost, by the fact that, in the former, prices vary directly with amounts, an increase of amount being accompanied by an increase in price, whereas, in the latter, the opposite relation holds, an increase in amount being accompanied by a decrease in price.

Explanation of Law of Decreasing Cost.

Manufactured commodities are largely produced under the law of decreasing cost. Transportation is also a good example of an industry operating under this law. While the law of increasing cost arises because of the part which nature inevitably plays in production, that of decreasing cost springs from man's

activities. That the unit cost decreases as the volume of production increases is due to the advantages of large-scale organization discussed in a previous chapter. An increased volume of production permits a more extensive use of machinery and a more profitable application of the principles of organization. These economies may be due directly to the increased efficiency of the individual organization or may arise indirectly as the result of large-scale organization in the industry as a whole or in its dependent industries. As an industry increases in size, it will not only be able to produce more cheaply, due to the increased efficiency of its individual concerns, but also will be enabled to purchase its machinery and materials at a lower cost on account of this same principle, reducing their cost as they, in turn, come to be made in large quantities.

This law also has its limitations; there is a point in most industries beyond which increased production ceases to be accompanied by decreasing cost, where the economies of large-scale organizations are exhausted and further increase is carried on either at constant or increasing cost. The location of this point will vary in different industries depending on the nature of the particular industry and on the extent to which plant and machinery can be used and the economies of large-scale production be taken advantage of. In supplying a local community with electricity, it may hold true for the whole supply. In the textile industry, the limit is more quickly reached than in the steel industry. In each branch of production, there is an establishment of ideal size, in which the commodity is turned out at the lowest possible cost. In the realm of production, efficiency sets bounds even to size.

The Influence of Decreasing Cost on Total Supply Price.

If the total supply were to be produced by one concern operating under decreasing cost, the lowest price at which they would supply any given amount would be determined by average cost. This would be a case of monopoly, however, and will be treated later.

In any competitive industry wherein the supply is furnished by individual producers operating under the law of decreasing cost, the supply price will be based on the average costs of

the marginal or high-cost producers. Among the operating concerns will be some, more advantageously situated, more efficiently organized, with larger and better-equipped plants operating at a low cost; others less advantageously situated, less efficient, or smaller plants, with higher costs. These latter will not continue to supply the existing demand at a price below their cost of production. The more efficient, on the other hand, will not sell below their less efficient competitors, so that the whole supply will be sold at a price based on the cost of the producers at the margin.

In an industry of decreasing cost, especially when cost descends rapidly, the individual producers being under a strong incentive to increased output, the supply tends to press on demand and occasionally outstrip it, provoking intense competition, which is apt to force price below the cost of production of the marginal concerns, to the peril of their existence. This situation will be discussed later; for the present, it is sufficient to emphasize the fact that in the case of a commodity produced under decreasing cost, the supply price will be based on the average cost of the marginal concerns whose supply is necessary to satisfy the existing demand and that it decreases as the supply increases. Many of the commodities which we enjoy today, from shoes to automobiles, could not possibly be sold for their present prices, were they not produced in large quantities.

Constant Cost.

In some industries, there is a tendency for cost to remain the same for a small or large output. The handicrafts of medieval times operated on this principle, and such industries as cigar making by hand and custom tailoring are modern examples. There is, also, a tendency toward constant costs in some industries, due to the counteracting influence of increasing and decreasing cost.

Influence of Increasing and Decreasing Costs on Supply.

Many commodities are produced partly under conditions of increasing and partly under these of decreasing costs. In the sugar industry, for example, the cane is grown on plantations operating, for the most part, under increasing costs, whereas it

is converted into sugar in factories under the law of decreasing cost. In the Hawaiian sugar industry for 1916 to 1917, 42.2 per cent of the total cost of producting a ton of sugar was cane cost, while factory cost constituted 34.8 per cent of the total. The tendency toward decreasing cost in the manufacturing end of the Hawaiian sugar industry is shown in a striking manner by arranging the factories into three groups according to their size. The average cost per ton of sugar produced in the thirteen factories of smallest output was $37.13; that of the thirteen of medium output, $33.79; while the thirteen largest had a cost of $33.55. In the Hawaiian sugar industry, the percentage of raw-material cost to factory cost is higher than in other centers of the sugar industry, but the influence of large-scale production in the sugar industry as a whole may be seen by glancing at the chart, which shows, as a general rule, the *low-cost* producers to be the *large producers;* in all the figures, the wide rectangles are to the left, growing narrower toward the right as they increase in height.

The extent to which the price of the finished product will be influenced by either of these two opposing tendencies will depend on the relative proportions of raw materials to manufacturing cost. In those industries such as the flour industry, in which the raw-material cost forms the major portion of the total, the law of increasing cost will dominate; in such industries as watchmaking, in which the manufacturing cost predominates, the law of decreasing cost will rule, with the result that the more popular the commodity becomes the lower will be the price at which it may be enjoyed.

In general, these two laws, the one by increasing the cost of agricultural products, the other by reducing the cost of manufactured goods, oppose each other in influencing the supply prices of finished commodities. A growing manufacturing nation can escape the tendency toward rising prices for its raw materials only by importing them from newly opened lands in undeveloped countries. Thus did Great Britain, by the repeal of her corn laws in 1846, open up a way of escape to her hard-pressed population from high food prices by importing her food supply from Australia, Canada, and the United States and by her free-trade policy has since been able to obtain the raw materials for her

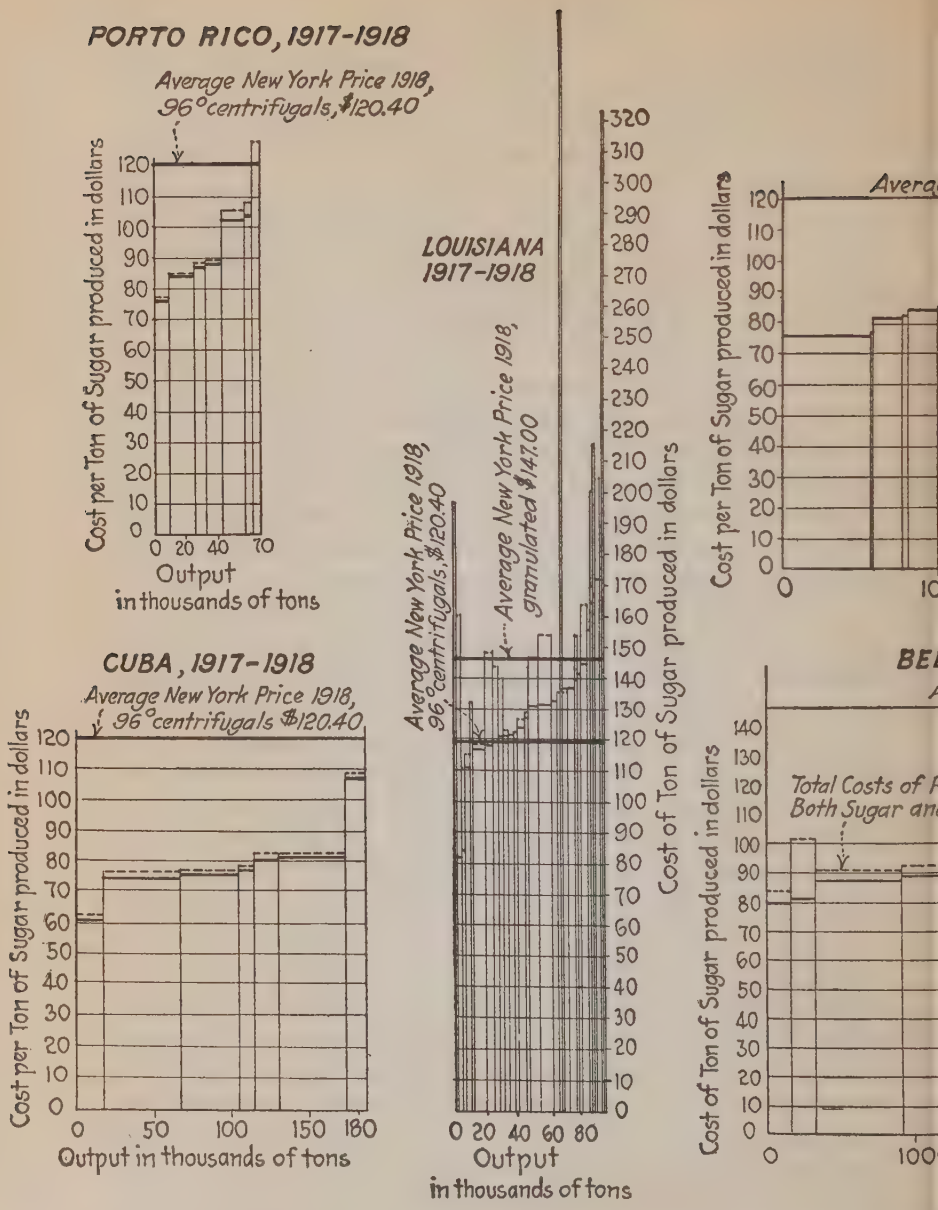
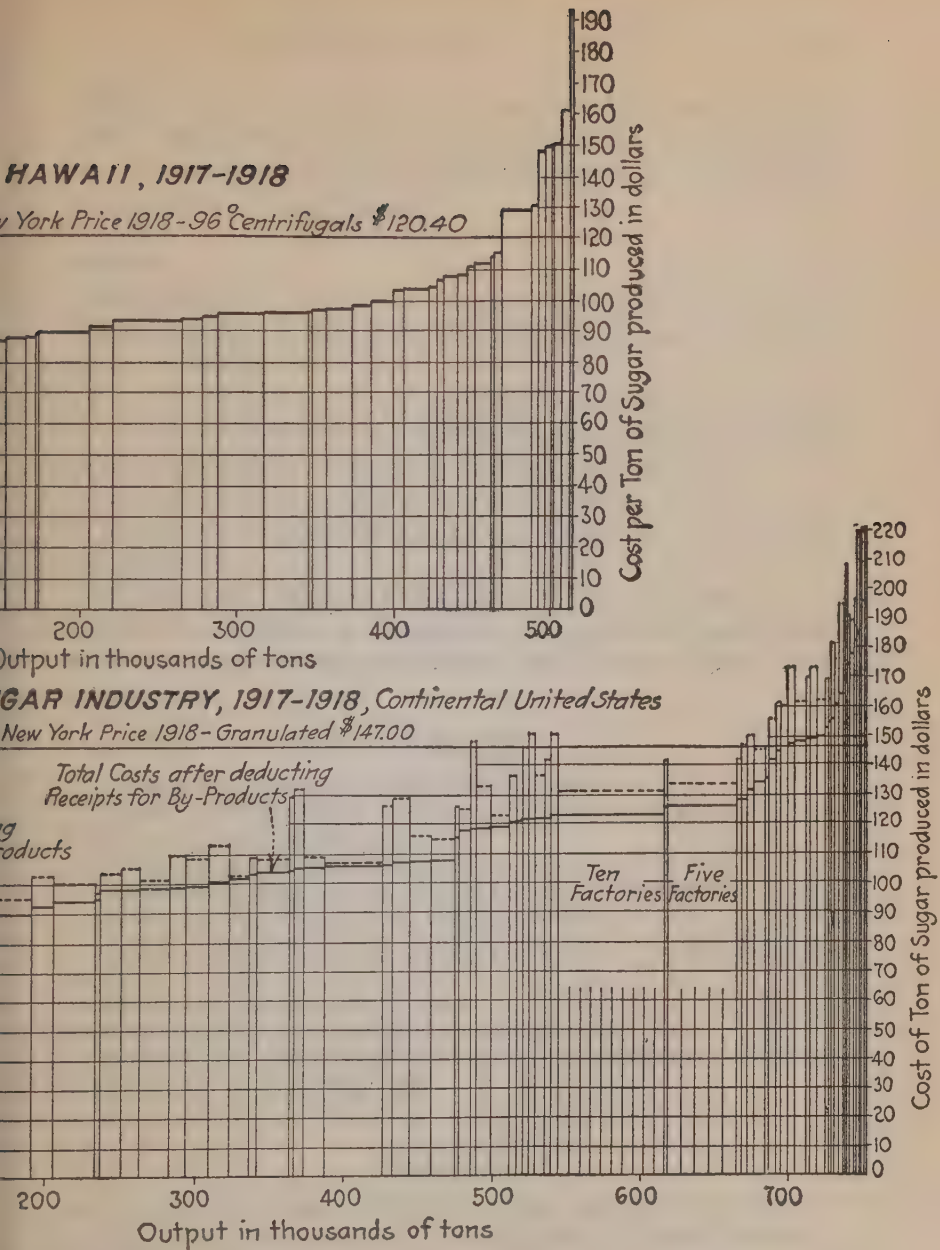

PORTO RICO, 1917-1918
Average New York Price 1918, 96° centrifugals, $120.40
Cost per Ton of Sugar produced in dollars
Output in thousands of tons
LOUISIANA 1917-1918
Average New York Price 1918, 96° centrifugals, $120.40
Average New York Price 1918, granulated $147.00
Cost of Ton of Sugar produced in dollars
Output in thousands of tons
CUBA, 1917-1918
Average New York Price 1918, 96° centrifugals $120.40
Cost per Ton of Sugar produced in dollars
Output in thousands of tons
Cost of Ton of Sugar produced in dollars
Total Costs of Both Sugar

FIG. 11.—COSTS OF PRODUCTION IN THE

Explanation: Horizontal measurements from 0 in each figure (abscissas) show output in to the ascending full line total costs after deducting receipts for by-products: those to the d marketing, depreciation, taxes (except Federal income and excess profits), insurance, rent, line measures the average price per ton of sugar and the distance from the ascending full lin



NDUSTRY, 1917–18, ARRANGED BY FACTORIES

ls of tons. Vertical lines (ordinates) measure costs in dollars per ton of sugar produced: those e total costs of producing both sugar and by-products. Costs include cane or beets, factory, d, but do not include interest. The distance from the base line to the upper horizontal price line shows the profit, factory by factory.

(*Facing page 228*)

manufacturers at much lower cost than she could have produced them herself, even if that were possible. In this tendency we see revealed one of the great underlying causes of the territorial expansions of the older nations.

Summary.

Cost influences the supply prices of commodities by increasing, decreasing, or remaining constant, as the amount of their supply increases.

The law of increasing cost operates in agriculture, resulting in a tendency toward an increase in the supply price of agricultural products with an increase in the quantity supplied.

The law of decreasing cost tends to reduce the supply price of manufactured commodities, as the volume of their production increases.

In both cases, the total supply price tends to be based on the cost of the producers at the margin, but under decreasing cost there is a tendency toward oversupply with price falling below marginal cost.

Test Questions

1. In what three ways does cost influence supply?
2. What unit of the supply determines the supply price of a commodity under the law of increasing cost?
3. State the law of diminishing returns in reference to land.
4. Explain the effects of this law on the cost of the food supply of a nation as time goes on and the population increases.
5. What considerations must be taken into account in estimating the effects of the law?
6. What will the unit cost be based on in the case of an individual producer operating under the law of increasing cost?
7. Explain the action of decreasing cost in an industry operating under the law of decreasing cost.

References

BÖHM-BAWERK, E., "Positive Theory of Value," Book IV, Chap. VII.
CAIRNES, J. E., "Character and Logical Method of Political Economy," Part I, Chap. III.
CAREY, M., "Political Economy," Chaps. III–VII.
CARVER, T. N., "Principles of Political Economy," Chap. XXIII, "Distribution," Chap. II.

CLARK, J. B., "Essentials of Economic Theory," Chap. VII.
CLAY, H., "Economics for the General Reader," Chap. XIV.
FETTER, F. A., "Economic Principles," Chap. VII.
FRIDAY, D., "An Extension of Value Theory," *Quart. Jour. Economics*, Vol. 33, pp. 197–220.
FLUX, A. W., "Principles," Chaps. IV, V.
HADLEY, A. T., "Economics," Chap. III.
KESTER, B. B., "Accounting."
MARSHALL, A., "Principles of Economics," Book IV.
NICHOLSON, J. S., "Principles of Political Economy," Chap. X.
RICARDO, D., "Principles of Political Economy and Taxation," Chap. I.
SEDGWICK, H., "Principles," Book II, Chap. II, 1883.
SMITH, A., "Wealth of Nations," Book 1, Chap. VII.
TAUSSIG, F. W., "Principles of Economics," Chaps. XII–XVI.
WICKSTEED, P. H., "Common Sense in Politieal Economy," Book I, Chap. IX.
WRIGHT, P. G., "Value Theories Applied to the Sugar Industry," *Quart. Jour. Economics*, Vol. 30, p. 101.
Federal Trade Commission *Report* on meat-packing industry, 1919.

CHAPTER XVII

INFLUENCE OF COST AND UTILITY ON PRICE

Relation of Demand Price and Supply Price to Equilibrium Price.

Now that we have completed our survey of the demand and supply sides of the market, we are in a position to see the real nature of the equilibrium price. We saw before that the law of demand and supply tends to pick out a certain price, which, as was said, equates demand and supply, inasmuch as it is that price at which buyers and sellers are both willing to trade the same amount. In other words, the interaction of demand and supply tends to pick out of the possible prices and amounts of the two schedules the pairs that coincide. The equilibrium price is, therefore, the demand and supply price in one.

As the demand price, it is that price at which buyers will purchase the whole of the given supply. It is based on the utility of the commodity to the marginal buyers.

As the supply price, it is that price necessary to induce the sellers to supply the given amount and is based on the cost of production of the marginal producers.

These two brought together in one focal point constitute the equilibrium price; the one price at which the two contending parties *en masse* are brought into agreement at their respective margins.

The Equilibrium Price in the Light of the Forces which Determine It.

When discussing the interaction of demand and supply, we said it seemed as if two blind forces were forever seeking the price that would set them at rest. Whether above or below this

point on the dial of value, prices always tend toward it, seemingly impelled by some unseen force, as the steel needle of the compass is ever attracted to the north by the magnetism of the earth. We now see this actually to be the case; price movements are governed by forces coiled within the hearts of men, and the equilibrium price is, in reality, that price which is established by the balancing of the two opposing forces, desire and cost.

It is at the margins of demand and supply that these two forces exert their influence. The demand price is governed by the utility of the commodity to the buyers at the margin; the supply price, by the cost of production to the marginal producers. The equilibrium price is that which just balances the cost of the commodity to the marginal producer and its utility to the marginal consumer.

Should the demand price be above the supply price, it would mean that the utility of the commodity to the marginal buyers, measured in terms of money, exceeds the cost to the marginal producers, measured, also, in money. This state of affairs in which the price is above the cost of the marginal producers will stimulate production; supply will increase and prices fall.

Should the demand price be below the supply price, it would signify that the utility of the commodity to the marginal consumers was less than the cost to the marginal producers. This condition will tend to discourage production; supply will decrease and prices rise.

Only when demand and supply prices coincide are the two forces of desire and cost balanced. Any change in either demand or supply upsetting the balance of these two forces sets them in motion, and their interaction will again tend to force prices to the equilibrium point.

We are thus able to see behind the fluctuations of prices the forces that govern them; to see the reason for the statement of the business man that demand and supply determine prices. The equilibrium price is that price which desire and cost working through the minds of buyers and sellers tend to establish. It represents desire and cost brought into harmony in terms of money. Behind all prices and price changes everywhere are these two elemental forces.

Variations from Market Prices.

It is plain that the equilibrium point toward which the market price of a commodity sold under competitive conditions tends is not a fixed point. This could be only in a hypothetical state of society wherein there was no change. It should not, furthermore, be assumed that the law of supply and demand sets a rigid market price at which all sellers must and do dispose of their wares. This is very far from what actually occurs. An investigation of the market for almost any commodity will reveal considerable difference in the prices at which it is sold. While there will be a general or market price at which the bulk of the sales will be made, some concerns will be found selling above and others below, in the same market. The explanation of this is to be found in the leeway between the market price and the respective margins of cost and demand.

The market price at any one time will tend to approximate the cost of the marginal producers, on the one hand, and the price of the marginal consumers, on the other. The more efficient producers with lower costs could sell if they wished at a lower price. Whether they will do so or not will depend on their price policy. To sell below the market is often thought to be a mistaken policy, bringing only destructive competition and lowered prices with little or no profit for any. Some new concerns, however, may sell below in order to secure sales and gain a foothold in an established industry. Some may do so in periods of depression to increase volume or because the lessened sales resistance allows of a less expensive method of selling. Other concerns prefer to sell at the market and secure their volume by intensive selling methods. Still others choose to sell above the market price. The market price is based on what will be paid by the least capable buyers at the margin of demand. There are many who would pay more, and the sellers see to it that some of them do. This may be brought about by creating a belief in the minds of the buyers that the article is superior to that of their competitors or by using aggressive sales methods, or it may be due to the inertia or indifference of buyers.

These individual differences in prices are accounted for partly by the effects of the more farsighted sellers to adjust their prices to changes in the conditions of demand or supply. When

costs increase as they did during the war some concerns will brave competition earlier than others by raising their prices and paving the way toward a higher market price. When scarcity in the supply and intensity of demand combine to make for a higher level of price as in the case of houses during the war and postwar period, some will take advantage of such a situation much sooner and to a greater extent than others and hasten the rise. When the tide changes and the demand begins to recede the cooler, shrewder heads who have been studying economic conditions quickly sense the change, lower their prices ahead of the crowd and connect with the new demand at the lower level.

If there be a sudden and drastic drop in demand, such as occurred in 1920, it may mean that the marginal demand price has dropped below the costs of the marginal producers who will be forced to lower their costs or be driven out of business. Many caught with stocks on hand, produced at the old high costs, were reluctant to sell them at a loss and held on hoping for a return of high prices. The consumer refused to buy at the existing high prices, and demand continued falling. Those who analyzed the situation aright, who realized that the halcyon days of high prices were gone forever, got down to earth, quickly set about cutting their costs of operation, liquidated their high-price stocks, and anticipated the inevitable fall in market prices by lowering the prices of their products below those of their competitors. This was not by any means an easy task, especially for the manufacturers who sold their products to the ultimate consumer through the middlemen. It was of little avail for the manufacturer to lower his price unless the wholesaler and retailer followed suit. The consumer still held off, and the manufacturer had to beat time with his plant half closed down for lack of orders. This does not mean that all retailers refused to lower their prices and that all manufacturers lowered them. On the contrary, many of the more progressive retailers, being in closer contact with the buying public, were among the first to sense the change, liquidated their high-price stocks, and brought whatever pressure they could to force lower prices from reluctant manufacturers. But in many cases, the small retailer, not so well versed in economic conditions as the large manufac-

turer and loath to tear himself away from the easy ways and big profits which the postwar period had allowed him to indulge in, stuck to his old stock and prices. Situated as he was at the neck of the bottle of distribution, his sluggishness caused those manufacturers who did reduce their prices quite a problem.

The bold action of the Interwoven Stocking Company in the early part of 1921 offers an interesting example of the manner in which some of the more progressive concerns successfully solved this problem and blazed a path to a newer and lower market price. The situation at the close of 1920 in the stocking industry was similar to that in many other lines. The bottom seemed to have dropped out of the market. The majority of factories were working at less than half capacity. The Interwoven people were convinced that the old high prices had gone forever and that prices were due to drop much lower. They believed that people would buy if the price were right, that there existed a demand at a lower price. They resolved to cut their prices to this level and avail themselves of the increased sales which they had faith would be forthcoming. They determined to do this, moreover, at one bold strike rather than by degrees. As Mr. Mettler, president of the company, put it:[1]

> We figured that if a dog's tail had to be cut off you can't save hurting the dog by cutting it off little by little! We knew that by April we would have to cut our prices practically in half. We decided to make the full cut at once, reducing our 75 cents (at retail) numbers to 40 cents, our $1.50 numbers to 75 cents, and our $2 line to $1.25.

The reason was fully explained to the dealers and their cooperation secured. Three months was given them to get rid of their old stock before putting the new prices on the top tickets of the stock.

This drastic action on the part of the Interwoven Company involved the writing off of $1,156,000 of inventory at one stroke of the pen and, also, making a price below their then costs which were based on part-time cost of production. The new price was based on the lower costs of the anticipated full-time production that would accrue from the lowered price. The results fully

[1] *Printers' Ink.*

justified their course, for while most of their competitors were running on half time the Interwoven had one of the best years in its history.

The Relative Influence of Utility and Cost on Prices.

In years gone by, some vigorous disputes have been waged as to which determined value—utility or cost. Ricardo was the great champion of the hosts of cost, while Jevons stands as the most famous exponent of utility as the determinant of value. Thus did these two great men attack the truth from opposite sides and we of the present are indebted to them for our broader viewpoint of the whole. Utility and cost act together in determining price. To discriminate between them and say that either is *the* determinant is like saying that one side of a pair of scales determines the weight. There is a sense in which utility is said to be the more fundamental: As it is the cause for the expenditure of cost, it takes the initiative. Demand is the draft that draws the fires of industry; it invokes supply; because a commodity is wanted, it is made; otherwise, it would not be produced. But it is just as true that industry will not furnish a commodity without cost, any more than a fire will continue to burn without fuel. The perennial argument as to which is the more important is, in the main, of academic interest. The question of practical import is, What is the relative power of the buyers and the sellers on price? And as this includes a view of the influence of both the forces at issue, we shall briefly discuss it pro and con.

The Buyer's Influence on Prices.

To many, no doubt, it seems as though a chemical analysis would be required to find a trace of the buyer's influence on recent high prices; and this practically approximates the case with some commodities sold under conditions of combination or monopoly. In competitive selling, however, both buyers and sellers take a hand in settling price. It is quite true that sellers *directly* decide the price which they will charge for their goods; the joker lies in the fact that the buyers decide the *amount* that will be sold. The sellers are in somewhat the same position in reference to the buyers in the market as Artemus Ward to the

spirits in the sea, "I can call the spirits from the windy deep," said he, "but damn 'em they won't come." The sellers may charge whatever they please, but they are scarcely able to drag the buyers into their stores and force a purchase. The prices set by the sellers are subject to the law of demand; the higher the price the smaller the quantity sold. In order to sell their whole supply, they must adjust the price to suit the marginal buyers, whose purchases determine the amount that will be bought. The buyer's influence, though indirectly exercised, plays a very decisive part in price determination.

In the interaction of *demand* and *supply,* sometimes both are equally active in determining the price, sometimes either one may be the more active factor. In the case of a fixed supply with no reserve as to price, demand will be the active factor in settling the price. This has led to the statement that demand determines price. If one hundred units of a commodity were offered for sale on a market with no restriction as to price and the demand schedule showed that at a price of 10 cents buyers were willing to purchase one hundred units, 10 cents would be the highest price that they would fetch. We might say, therefore, that the price was determined by demand—by the buyers. In so doing, we take for granted the amount of the fixed supply, which had it been less would have resulted in a higher price; had it been more, in a lower. The amount of the supply being fixed, we ignore its influence and say that demand determines the price. Marshall, the English economist, has aptly likened demand and supply to the blades of a pair of scissors. If we hold one still, we may say that the cutting has been done by the other. In this sense only can we say that demand determines the price.

In considering the relative influence of demand and supply on prices, time is an important factor. The shorter the period taken into consideration the greater the tendency toward a fixed supply, due to the fact that over a short period the supply is limited by the existing factors of production. Price will be at the mercy of demand, any sudden change in which will tend to raise or lower it. But given a period long enough to allow the factors of production to adjust themselves, supply will take a more active part in the price process by virtue of its control over the amount offered for sale. As a general rule, the shorter

the period of time the more decisive will be the influence of demand.

While it is always true that buyers and sellers both have a share in price determination, it is well worth while noting that sometimes the one, sometimes the other, holds the whiphand.

The Influence of Sellers on Prices.

While it is self-evident that sellers cannot sell at any price they please, it is equally evident that buyers cannot buy at any price they please. Just as the selling price influences the amount that will be bought, so the price the buyers are willing to pay influences the amount which they will be able to buy. In the same way as the sellers' prices are subject to the law of demand, the buyers' prices are subject to the laws of cost which govern the amount of the supply. The demand price for any given amount must be at least equal to the cost of the marginal producers, or they will not continue its production. In order to secure the amount which they require, buyers must pay a price sufficient to induce the marginal producers to supply it.

The power of the seller over prices is exerted through his control over the amount produced. Under perfectly free competition—that is, in the absence of combination or monopoly—this control is exerted solely through the cost of production. The amount of the supply is limited by the cost of the marginal producers. The efficiency of this control in limiting supply and maintaining price on an equality with marginal cost depends on whether the commodity is produced under conditions of increasing or decreasing cost.

Relation of Cost to Scarcity and Value.

We will digress here for a moment to notice with more exactitude the relation of cost to value. In discussing value, we found two primary causes, scarcity and utility; in discussing the prices of the products of industry, we have spoken of them as being determined by cost and utility. Is cost, then, a third cause of value on a plane with scarcity and utility?

The products of industry by very definition involve cost, which is the chief factor limiting their supply. In this they differ from natural products the supply of which is limited by

nature. The values of both are directly determined by utility and scarcity, but in the case of industrial products cost enters the scene as a special cause of their scarcity. It bears the same relation to value as labor the position of which we discussed on page 156. The cost-of-production theory of value is an outgrowth of the labor theory; both are supported by much the same arguments, both may be shown inadequate as explanations of value for the same reasons. Cost is a secondary cause of value, acting always through scarcity, which with utility determines the value of everything. The vital part which cost plays as the cause of the scarcity, as the regulator of the supply of the products of industry sold under competition, justifies, however, the emphasis placed upon it.

The Influence of Decreasing Cost on Equilibrium Price.

In those industries in which the individual producers are operating under decreasing costs, there is a tendency to instability on the part of the equilibrium price.

Should the actual price be above the equilibrium, it would mean a price above marginal cost; this would stimulate production and price would fall. The ominous feature about price under decreasing cost, however, is that it is possessed of a tendency not to stop at the equilibrium but to keep on falling.

The equilibrium price of such a commodity, it will be recalled, is based on the minimum output of the marginal producers. The temptation of larger profits from the lower cost of a larger output will be a constant stimulus to them as well as to the rest of the producers in the trade who are operating under decreasing cost to forge ahead and increase their volume of production. Supply thus spurred on will overtake demand, and price will tend to fall.

Under increasing cost, if the price fell below the equilibrium and, thus, below marginal cost, the only course open to the marginal producers was to cut cost by reducing output; cost thus automatically reduced supply, and the price rose. Under conditions of decreasing cost, the situation is reversed. The way of escape to lower cost lies in the direction of increased volume. Cost thus acts to increase supply even when price is below the costs of the marginal producers.

This state of affairs leads to cutthroat competition. Some of the marginal producers, in order to sell a larger volume at a lower cost, will cut the price. Others must follow. As prices sink, the weaker concerns are forced out of business. The large and efficient concerns and those able to make the changes necessary for volume production survive. For awhile, the supply may be reduced and price go up, but as long as any of the producers are operating under decreasing cost, supply will continue to press on demand and price will tend to fall below cost. Should the industry be one in which the point of decreasing cost is soon reached and is followed by increasing cost, this tendency will cease.

Resulting Trend toward Combination or Monopoly.

If the industry is one of large-scale production, the course of evolution will inevitably set toward combination or monopoly, either peacefully by the former, or along the warpath of competition with its struggle for existence and survival of the fittest; or by both methods, as illustrated by events in the steel industry during the 'nineties. Uncontrolled competition in an industry of decreasing cost means cutthroat competition, rate wars, price below cost, an intense struggle for existence on the part of the marginal concerns with their elimination or absorption by their bigger competitors. The sole avenue of escape from the drastic action of demand and supply under decreasing cost is for the producers to regulate the supply by combined action. Here free competition ceases and combination begins.

If the looser forms of combination, such as mere understandings arrived at through manufacturers' associations, gentlemen's agreements, and pools, are declared illegal or fail to accomplish their purpose, competition if given free rein will eventually destroy itself and evolve into combination or monopoly. A state of cutthroat competition and rate war is never permanent; men get tired of the strain and strife. If carried to the bitter end, such a struggle results either in the formation of some powerful monopolistic organization, able by virtue of its control over the supply to stabilize the price, as does the United States Steel Corporation the price of steel, or in the formation of several large concerns which by intercourse through trade

associations are able to cooperate instead of compete in the regulation of supply.

Uncontrolled competition, then, tends to be replaced by some form of combination, not only on account of a desire to escape the drastic consequences of the law of demand and supply under decreasing costs but also by the dual benefits to be derived, on the one hand, from the economies of large-scale organization and, on the other, from the power over price which combination gives to the producers. The crux of the whole price question lies in the extent to which the producers are able to control the price by virtue of their ability to regulate the supply through combination or monopoly.

Summary.

The law of demand and supply is based on the interaction of the two forces, desire and cost. The equilibrium price is simply the price which these forces tend to establish when left to work themselves out under conditions of free competition. It is that price which the free bargaining of buyers and sellers tends to fix, which brings them both into agreement, being equal to the costs of the marginal producers on the supply side and the utility of the commodity to the marginal buyers on the demand side.

In the case of a commodity produced under conditions of decreasing cost, there is a tendency for price to fall below marginal cost, due to the instability of supply and its tendency to overtake demand. Cost fails to limit the supply. Producers have thus been forced by the pressure of circumstances to combine for their own protection. Uncontrolled competition, which means unregulated supply, has thus been replaced by combination, which means regulated supply. The question which remains to be answered relates to the nature and extent of the control over price by combination and monopoly.

Test Questions

1. What is meant by "demand price"? "Supply price"? "Equilibrium price"?
2. What two forces determine the equilibrium price of a competitive market?

3. Under conditions of competition, what influence do buyers have on prices?

4. How is the control of the seller exerted on price under competition?

5. Explain the tendency toward combination in an industry of decreasing cost.

References

CAIRNES, J. E., "Character and Logical Method of Political Economy," Part I, Chaps. II–IV.

CLARK, J. B., "Essentials of Economic Theory," Chaps. III–VI.

CLAY, H., "Economics for the General Reader," Chaps. XIV, XV.

ELY, R. T., "Outlines of Economics," Chaps. X and XI.

GREEN, D. I., "Pain Cost and Opportunity Cost," *Quart. Jour. Economics*, Vol. VIII, 1895.

HOBSON, J. A., "Economics of Distribution," Chap. II.

LAUGHLIN, J. L., "Political Economy," Chap. XV.

MARSHALL, A., "Principles of Economics," Book V.

SELIGMAN, E. R. A., "Principles of Economics," Chaps. XII–XVII.

SMITH, A., "Wealth of Nations," Book I, Chaps. V–VIII.

TAUSSIG, F. W., "Principles of Economics."

WALSH, C. M., "Measurement of Exchange Value," Chap. I.

CHAPTER XVIII

THE INFLUENCE OF MONOPOLY ON PRICE

Nature of Monopoly.

Thus far in our study of the action of the law of demand and supply in determining price we have assumed that there is no concerted action on the part of buyers or sellers to control either the demand or the supply. Any control of either interferes with the free action of the law. Free and open competition implies independent action, all absence of agreement, on the part of buyers or sellers. Monopoly, as the term is usually employed, implies a control over the supply by the sellers. Just as soon as competing producers are able by joint action to control supply and influence price, monopoly power begins. Such control ranges from the indefinite yet effective regulation brought about by an understanding between competitors to complete control over the whole supply by one sole producer. The central idea of monopoly is unified action in the control of supply. It is usually defined as such a control over the supply of a commodity as to enable the seller to fix the price.

Monopolistic Control Arising through Business Associations.

The loosest form of united action on the part of competing sellers arises from their association in trade organizations of various kinds. The number of such associations is legion. They exist in every branch of industry from farming to retailing. There are associations of lumbermen, dairymen, and producemen, milk distributors, iron and steel producers, shoe manufacturers, clothiers, bankers, bakers, grocers, credit men, and so on, local, national, and international.

Their purpose is to promote and protect the interest of their respective trade or profession. They gather and disseminate information of common value and discuss questions of common

interest; and in this connection, of course, prices are by no means taboo.

An interesting example of such association is seen in the asbestos business, in which there are three organizations, the Asbestos Textile Manufacturers' Association, organized in 1915; the Asbestos Paper Manufacturers' Association; and the Asbestos Brake Lining Manufacturers' Association, organized in 1916. These have the same secretary and work on the same lines. They are loosely formed on advice of counsel, confirmed by a representative of the Federal Trade Commission; they have no constitution or by-laws but are based upon a declaration of principles covered in the minutes of the first meeting as follows:

> It was decided to organize a permanent association, for the purpose of standardizing methods of manufacture, methods of cost finding, and for the purpose of distributing among the members all information as to quotations, contracts, and actual bona fide sales which might lawfully and justly be published.

The secretary states that

> . . . no effort is made to fix or control prices or in any other manner to stifle or influence trade. The whole object of the association is to place before each member at periodical intervals concise and accurate information as to the tendencies of supply and demand, prices, production, and so forth.

This is an example of what is termed the "open-price idea" in association work. The secretary further states that before the organization of the association, many of the men were competing each with the other without even having met personally. Now that they meet monthly, old-time jealousies, suspicions, and disagreements have disappeared and in their place have sprung up good feeling, mutual reliance, and harmony of action; "general conditions have been so improved that you could not find a member who would for a moment consider giving up the *cooperative competition idea.*"

There is not a shadow of a doubt but that such organizations are a benefit to their members and are, also, productive of much good to their respective trades and to industry as a whole. There is likewise no doubt but that such organizations afford an oppor-

tunity for concerted action on the part of sellers in controlling supply and regulating price. That such association, by which free-for-all competition is replaced by cooperative competition, may give rise to understandings and agreements regarding price and may place in the hands of the sellers a certain monopolistic power is well illustrated by events in the newsprint-paper industry during the war when the balance between the supply of and the demand for paper was uncomfortably close. The Federal Trade Commission, after a most careful investigation of that industry, states, in its report issued on Mar. 3, 1917, that

> By means of a trade association, organized ostensibly for a lawful purpose, conditions in the market were influenced in a very substantial degree and in a manner which sustained a price which would not be possible under conditions of free competition. Concert of action was made possible through this association in the matter of discouraging new production of newsprint paper, in the division of customers, in the promotion of fear that the supply would not be equal to the demand, in disseminating propaganda justifying higher prices because of alleged higher costs, and in other ways. The increase in the prices charged are not justified by the increased costs of production.

The idea of cooperative competition is sound; it is the natural child of changed industrial conditions; it is supplanting individualistic competition throughout the whole of industry and rightly so. It should be clearly understood, however, that such cooperation on the part of sellers places in their hands a *power over price that does not exist under free-for-all competition,* a power which by virtue of its very subtlety is by no means universally recognized, but which is, perhaps, more far-reaching in its effect on prices than that of the big monopolist who looms up more conspicuously in the popular mind and is, on that account, the more likely to be curbed.

Specific Agreements and Pools.

Closely akin to the unity of action by competitors arising from business association is that springing more directly from alliances formed for the distinct purpose of influencing prices. These alliances range from mere meetings of competitors with little or no special machinery for the execution of their purpose, such as the famous Gary dinners, to the loose form of organiza-

tion known as the "pool." The form of agreement may be a mere understanding in regard to price, a "gentleman's agreement," or a formal contract involving a restriction of output, a division of territory, price fixing, or division of profits. The testimony of Charles M. Schwab before the Industrial Commission is illuminating in regard to the extent of such practices. When asked if there had been pooling agreements in the steel industry, he replied:

> Yes, in all lines of business, not only in steel but in everything else. There were similar agreements, known as joint agreements to maintain prices. They have existed in all lines of business as long as I can remember.

The name "pool" has been used indiscriminately to apply to all forms of united action by competitors for the purpose of controlling supply or influencing price; strictly speaking, however, a pool involves the placing of a part of the receipts or profits into a common fund to be distributed among the members by agreement. The pool first came into prominence among the railroads, which adopted this method of joint action to prevent rate cutting and stifle competition. They have existed in manufacturing industries since 1860, though the great era of the pool proper was from 1870 to 1887. Railroad pools are illegal; and in manufacturing, pooling agreements have usually been held to be contracts in restraint of trade and, therefore, against public policy. They are an unstable form of organization, their weakness lying in the fact that, their contracts being unenforceable by law, it is hard to hold the contracting parties in line.

Pools and agreements, in spite of their weakness and their disfavor in the eyes of the law, have played an effective part in price control, and, contrary to the opinion of some writers who treat them as relics of a bygone age, they still flourish in great variety, especially in their more elusive forms. The report of the Federal Trade Commission on the meat-packing industry reveals some interesting facts in this connection. It appears that the first pool in that industry was brought to light through an investigation by a United States Senate committee, which, in 1890, reported that there was an agreement between the then leading packers to refrain from competition; that there was col-

lusion with regard to fixing of prices, division of territory, and business. These conditions were partly responsible for the passage of the Sherman Act in 1890. In 1912, it was admitted by Henry Veeder under oath that from May, 1893, to May, 1896, representatives of the leading packers met regularly every Tuesday afternoon in a suite of rooms leased in the name of Henry Veeder, who acted as secretary and statistician. At these meetings the territory was divided and the volume of business to be done by each packer was apportioned upon the basis of statistics compiled by Veeder, penalties being levied when any one of them exceeded his allotment. This "Veeder pool" was followed by other pools and supplemented by a policy of concentration and combination by the big packers, who absorbed many of the strong independents. As soon as one pool was broken or rendered impolitic by a government investigation, another was formed.

Selling Organizations.

Somewhat similar to the pool is the selling organization, formed by a number of competing producers for the purpose of marketing their joint product. This is a more compact form of organization, very common in Germany but by no means rare in the United States. The best known examples are, perhaps, the fruit growers' exchanges. The stockholders of the exchange are the growers; the exchange acts as a selling agency, charging commission for its services. A good example of such an organization is the California Fruit Growers' Association, a non-profit corporation under the laws of California, acting as a selling agency for over 10,500 fruit growers, who are organized into 200 local associations, each of which has its packing house where the fruit is assembled, pooled, and packed for shipment. These local associations ship their fruit through twenty district exchanges, which act under the direction of a central exchange. The central exchange is managed by a board of seven directors acting through a general manager. It looks after all matters relating to the selling of the fruit, has agents in all the principal markets of the states and Canada, secures information relative to the demand, conducts extensive advertising campaigns, and develops new markets.

These organizations are a good example of cooperative com-

petition where cooperation was needed. Speaking generally, the farmers and growers have been slower to organize than the manufacturers or the middlemen to whom they sell, which has placed them at a disadvantage and resulted in their often being forced to sell at prices which have not brought them a fair return for their efforts. The Cooperative Marketing Association has enabled them to get their product more directly to the jobbers and grocers and to eliminate speculation. They have improved conditions and, through their advertising, have established brands, thus giving the public the assurance of standard quality. There is no doubt that they eliminate competition and influence prices —"stabilize" them would be the better word. In fixing prices, they must, of necessity, pay considerable attention to demand, which is elastic in the case of fruit. So far, their influence has been beneficial to the producer and not harmful to the consumer, but in view of the rapid increase in these associations during the last five years, the fact should not be lost sight of that each is replacing free competition by an organized control over the supply of a commodity by virtue of which it is able to wield a powerful influence over price.

Combination.

The various forms of organizations discussed so far have been loose in form and more or less ephemeral, while the fact that the united parties still retained their autonomy as producers afforded only an incomplete control over the supply; hence, a more stable form, insuring a firmer grasp over supply, was sought. The famous "trust" was first tried, a union of separate corporations, each of which transferred its stock to a group of trustees who then controlled the constitutent companies. The trust being declared illegal, the holding company was devised, which achieved the same purpose. The merger followed later. These two, which we have already described, secure perfect control over the constituent companies and complete unity of action. The extent of monopoly power wielded by one of these organizations will depend largely on the percentage of the supply of the whole industry controlled by it. The American Sugar Refining Company in 1892 controlled 90 per cent of the entire sugar-refining business of the country. The whisky combination controlled as high

as 90 per cent of the entire production of spirits. The United States Steel Corporation in 1901 controlled about 60 per cent of the iron-ore supply of the United States and about 65 per cent of the country's steel production, a percentage which has since been reduced.

The degree of monopolistic control is not confined to the amount of output directly controlled by any one combination but is reinforced by the ease with which a few combinations in any one industry can cooperate in the ways illustrated among themselves or with small independents. In the salmon-packing industry, for example, five [1] groups of companies control 51 per cent of the entire output and set the price at which the great majority of the packers dispose of their product. The "Big Five" in the meat-packing industry are said to control [2] 70 per cent of the live stock slaughtered by all packers and butchers engaged in interstate commerce.

Degrees and Forms of Monopoly Control.

In this analysis of the means by which unity of action is secured by competing producers in the control of supply and price, we have passed from the indirect to the direct, the loose to the compact, the incomplete to the complete. It has been a journey from competition to monopoly along the road of cooperation and combination.

Monopoly Power over Price Illustrated.

The essence of monopoly is power to regulate supply so as to fix price. This is illustrated in the diagram (Fig. 12). The demand and supply curves *SS* and *DD* indicate that under competitive conditions the amount *OC* would be produced at the price CC^1. The rising supply curve indicates that the commodity is produced under the law of increasing cost, the one price at which the whole would sell being based on the cost of the marginal producers. The combined profits of the competitive producers are measured by the triangular area PC^1S.

Should the producers get together in such a way as to be able to control the supply, they would be enabled to command a

[1] *Federal Trade Com. Rept.* on Canned Goods, December, 1918.
[2] *Ibid.*, on meat-packing industry, July 5, 1918.

higher price under the same conditions of demand. By restricting the amount of the supply to *OM*, they could command the price MM^1. This they might accomplish by raising the price to MM^1, which would enable them to dispose of *OM* units of the commodity at a profit represented by the area P^1M^1NS.

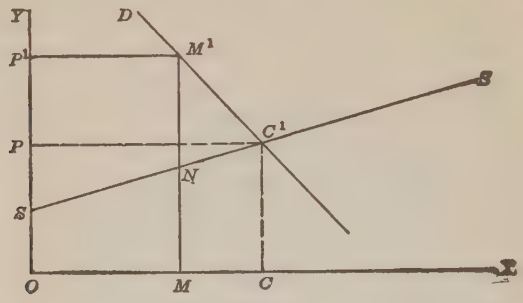


Fig. 12.

Law of Monopoly Price.

Monopoly price, therefore, will not necessarily be based on marginal cost but will be that price which will bring the largest profit to the seller or the sellers. The amount sold under monopoly will not be limited automatically by marginal cost, as under competition, but, by virtue of the control enjoyed by the monopolist over supply, it will be the amount that will bring him the most profit.

Under Decreasing Cost.

In the case of a commodity produced under decreasing cost, the monopolist, in order to fix the price that will bring him the most profit, must bear in mind that the higher the price, the fewer the sales and the higher the unit cost; and, conversely, the lower the price, the bigger the volume of sales and the lower the unit cost. He will seek by estimate or experiment that price which will bring him the largest net profit. In so doing he will keep his eye on gross receipts and total cost, the difference between which measures his gain. The following table illustrates such a case; under the assumed conditions, the monopolist would derive the largest profit by selling the commodity at 10 cents.

Unit price	Number of sales	Unit cost	Gross receipts	Total cost	Profit
$0.50	100,000	15	$50,000	$15,000	$35,000
0.30	170,000	12	59,500	20,400	39,100
0.25	300,000	10	75,000	30,000	45,000
0.15	800,000	7	120,000	56,000	64,000
0.12	1,500,000	5	180,000	75,000	105,000
0.10	3,000,000	4½	300,000	135,000	165 000
0.08	4,000,000	4¼	320,000	170,000	150,000
0.05	8,000,000	4	400,000	320,000	80,000

Tapping Several Strata of Demand.

It is somtimes stated by economists that monopolists are able to sell their product at different prices, while under competition the whole supply must be sold at one price. Theoretically, this may be possible, but in practice it is not common. The illustration is sometimes given of a branded good, such as soap, being sold at several prices, a standard grade being put out at 10 cents; a price of 25 cents being charged for the same soap, with a dash of perfume and a colored wrapper marked "Superfine." In such a case, it is not the same product, however slight the difference may be, but a different grade of product; and in competition, different grades fetch different prices even when these grades are purely imaginary, as in the case of grocers who have been known to sell coffee from the same bag at different prices by putting it in different bins marked 18, 25, and 35 cents.

It is, however, a common practice for monopolists to differentiate their product, as in the case of a branded good, and to sell at different prices by tapping several separate layers of demand, thus increasing their volume of sales and materially adding to their profits. To stick to our soap illustration, there is a large body of consumers who will not pay more than 10 cents for a cake of soap. There is a second class of people perfectly willing to pay 25 cents for their favorite toilet article; and still a fastidious third class, connoisseurs in soap, as it were, who will blithely pay 50 cents for a perfumed, artistically wrapped creation with a smack of distinction. In other words, there

are several strata of demand for soap, and this is true of most products, from condensed milk to automobiles.

Monopoly Power and Demand.

Monopoly power over price is much influenced by the conditions of demand. In general, the more elastic the demand the more careful must the monopolist be in fixing the price; the more inelastic the demand the greater will be his power over the price.

In the case of a commodity sensitive to price changes, a slight rise in the price will be followed by a big cut in sales; on the other hand, a large increase in the volume of sales will be secured by a small reduction in price. As a rule, it will not pay the monopolist to restrict unduly the supply of a commodity with an elastic demand; such restriction will make little difference in the price which he will be able to get. If he is manufacturing a commodity subject to decreasing cost, it will be to his interest to increase the supply, which he can do without being forced to lower price to any great extent. In this situation, "it pays to advertise," a fact which monopolists are coming to realize, much to their advantage.

For a commodity with an inelastic supply, the conditions are reversed. The monopolist will be able to raise his price without much fear of curtailing his sales, while they will not increase to any great extent much if he lowers price. A restriction of the supply will now make possible a big increase in price, while, on the other hand, an increase of supply would cause a big drop in price. Here, then, there will be every inducement for the monopolist to limit output and raise price.

Conditions of inelastic demand offer a tempting field to the monopolist and furnish a rich harvest of monopoly profit. In the case of the necessities of life, such commodities as bread, coal, light and heat, and local transportation, especially where there are no available substitutes, the monopolist may have the consumer at his mercy and wield a dangerous power.

Limitations to Monopoly Power.

In our discussion of monopoly price, we said that it was the price which would bring the monopolist the largest profit. This statement, to be correctly understood, needs to be qualified.

Should the monopolist enjoy a complete control over supply, it will be possible for him to fix the price calculated to bring the biggest profit. In actual practice, however, good business policy will usually dictate a more conservative course, because of the fear of three things, namely, competition, substitution, and government control.

Excessive profits in any branch of industry attract capital and invite competition just as surely as sugar draws flies. Recent history shows that even in those industries dominated by the most powerful combines, competition is by no means dead even if denatured. The history of the sugar, whisky, and steel industries demonstrates this. High prices also irritate the consumer and encourage substitution and there are few articles for which there are absolutely no substitutes. Finally, exorbitant prices attract the lightning of government legislation. A lower price than the highest price acts as insurance against these hereditary foes of monopoly, and for purely business reasons it will usually pay the monopolist to adopt a policy of wise restraint. The United States Steel Corporation is a shining example of a concern which has followed such a course since its organization. Properly amended the law will read that monopoly price is that price which in the long run will bring the monopolist the maximum profit.

Monopoly Price Usually High Price.

To say that monopoly always results in exorbitant prices would be an exaggeration of the facts. It is perfectly possible for monopoly price to be below competitive price, owing to the economies that may be attained by placing production under the control of one concern, as in the case of a local gas or electric supply. It may also be in the interest of the monopoly to set the price at a low figure as for instance when decreasing cost governs the production of a commodity the demand for which is elastic. Or the monopolist may have the interest of the public at heart and set as low a price as is consistent with a fair profit to himself. Making full allowance for these possibilities it is patent that as a general rule, the price of a commodity produced under conditions of monopoly will be higher than for that same commodity under conditions of free competition.

This is but a common-sense conclusion. There is no question

of the power over price which monopoly brings. The history of competition is nothing but a history of the continuous striving after this power by fair means or foul. Ever since the *Laissez Faire* period of the nineteenth century there has been evidenced in commerce a constant and irrepressible trend toward monopoly power.

Moreover, the verdict of history is that monopoly price is high price; it has at times meant exorbitant price, as with the government monopolies of medieval England. Unbiased students of modern monopoly, such as the late Van Hise, pronounce it to be higher than competitive price. A study of the evidence presented by the most exhaustive investigation of recent times, that made by the Industrial Commission appointed by Congress in 1898, into the nature of industrial combinations and their effect cannot fail to lead an impartial observer to the conclusion that such combinations have had the effect of raising the prices of the commodities which they control to a higher point than would have been the case under competition. More recent investigations reinforce this conclusion and give some glaring instances of the abuse of this power.

Competitive Price; Monopoly Price; and the Law of Demand and Supply.

Our study of prices has involved a study of the law of demand and supply, with its twin underlying forces, desire and cost, from whose interaction the law derives its power. In order to gain a clear view of the nature of the law, we first noticed its operation under conditions of perfectly free competition—ideal conditions, which allow the free interaction of the underlying forces. Under such conditions, an equilibrium price would be established, based on marginal cost and the utility to the marginal consumer.

But in actual life, competition is never perfectly free. In our modern industrial system, the inequality of competitors, the immobility of the factors of production, particularly the high degree of specialization in labor and capital, interfere with freedom of motion and clog the wheels of competition. There is always friction in the practical operation of all forces, whether mechanical or human. Hence, in stating the law of price under

actual competitive conditions, we said that prices *tend* toward an equilibrium price. We have used the term "tendency" all through our explanation. When dealing with human forces, it is, of course, impossible to measure them with the exactitude we have assumed, for instance, in the demand and supply schedules. But to make clear the action of the forces utility and cost, in determining price, it is necessary to use definite figures. It should not be thought, however, that because these forces are incapable of exact measurement they do not work according to law. They most certainly do, and the tendencies which we have presented show the action of the law as it operates under conditions of ordinary competition, unhampered and free from any manipulation.

In studying monopoly price, we find the same law, the same forces, but now operating under different conditions, under conditions in which the forces on one side are organized and, on the other, unorganized. Monopoly is such a control of the supply side of the law as enables the monopolist to manipulate the law to suit himself. Monopoly is simply manipulation of the law of demand and supply by one of the interested parties.

It is often said in reference to the failure of competition to establish a fair price that "business is conducted in opposition to economic laws," meaning the law of demand and supply, a statement due, perhaps, to the overemphasis which economists have sometimes given to this law as it operates under ideal conditions of free competition. The fact of the matter is that business today is conducted very much in accordance with the law of demand and supply. The law of demand and supply is buried deep in human nature and must always be reckoned with. It can, however, be regulated and controlled. And all that the monopolist is doing is to control the law for his own benefit. Here lies the gist of the whole matter. All human achievements come by working in harmony with natural laws. The monopolist is wise in his day and generation, and just as he has by control of physical laws increased the product of his plants, so by his use of the law of demand and supply he has been able to increase the price of those products in the market.

It is equally possible for the manipulation to take place on the buyer's side by the control of demand. It has been said

that "the husbandman has always been the dupe of the law of demand and supply." Here we have the reason; the farmer has heretofore played the game single handed; he has furnished the supply under conditions of individualistic competition for an organized demand. By means of the cooperative-marketing association, he is fighting fire with fire. Both sides being organized, a better equilibrium will be established and a fairer price obtained.

Summary.

Monopoly is usually defined as such a control over the supply of a commodity as to enable the monopolist to regulate the price. The source of monopoly power is unity of action either in the control of supply or in the control of demand. Such unity of action may be secured through the agency of the looser forms of business associations or through the more stable forms of the holding company and the merger. The degree of control ranges from the partial control exercised by the looser associations to the more complete control wielded by the big combination producing the whole or a major part of the supply of one industry.

Under conditions of monopoly, the price of a commodity is not subject to the restrictive action of competition which tends to reduce price to cost of production. The monopolist by virtue of his control over supply is able to regulate the price as he sees fit. This does not mean that he can charge what price he likes or that he will always be likely to charge the highest price. In the case of a commodity of elastic demand, a lower price with a larger volume of sales will bring a larger total profit. A price too high may be an invitation to potential competition or substitution or government regulation. To achieve the greatest profit in the long-run monopoly, self-interest will usually dictate a price lower than the highest possible, though it may be higher than that which might prevail were there competition.

Under competitive conditions, the price is determined by the natural interaction of the forces of demand and supply. Monopoly does not set at naught the law of demand and supply but, by controlling the forces on one side or the other, manipulates the law in its own interests.

Test Questions

1. What is the root idea of monopoly?
2. Explain the monopolistic effect on price of business associations.
3. What is a "pool"? What is the object of a pool or "gentleman's agreement"?
4. How might a "selling organization" exert a monopolistic influence on the price of a commodity?
5. What is the law of monopoly price?
6. What are the three limitations to monopoly power?
7. Is monopoly price necessarily the highest price?

References

COMPTON, W., "Price Problem in Lumber Industry," *Amer. Economic Rev.*, Vol. 7, p. 582.
DUNCAN, C. S., "Marketing, Its Problems and Methods."
ELY, R. T., "Outlines of Economics," Chap. XII.
FETTER, F. A., "Economic Principles."
HIGHAM, C. F., "Scientific Distribution."
JENKS, J. W., "The Trust Problem."
LITMAN, S., "Price Control during the World War."
MARSHALL, A., "Principles of Economics," Book V; "Industry and Trade."
NYSTROM, P. H., "The Economics of Retailing."
SEAGER, H. R., "Principles of Political Economy," Chap. XIII.
SHAW, A. W., "Some Problems in Market Distribution."
SIMPSON, K., "Price Theories," *Quar. Jour. Economics*, Vol. 35, p. 287.
TAUSSIG, F. W., "Principles of Economics," Chaps. XII–XVI; "Price Fixing," *Quar. Jour. Economics*, p. 240, February, 1918.
TOSDAL, H. R., "Open-price Associations," *Amer. Economic Rev.*, Vol. 7, p. 331.
VAN HISE, C. R., "Concentration and Control."
WELD, L. D. H., "The Marketing of Farm Products."
WICKSTEED, P. H., "The Common Sense of Political Economy," Chaps. V–VIII.
WYMANN, B., "Control of the Market."

CHAPTER XIX

NATURE AND EXTENT OF INDUSTRIAL MONOPOLY

The Vital Elements of Monopoly.

In our investigation of prices, we were inevitably led into a discussion of monopoly from the viewpoint of its influence on price determination. It should not be inferred, however, that monopoly is entirely a question of price control or regulation or that the only kind of monopolies are those arising through combination. There are other kinds of monopolies, and while the ultimate objective of monopoly power is price control, and the profit arising therefrom, there are other motives and issues involved which vitally concern the industrial, social, and political welfare of the nation. Monopoly power affects not only prices but also the equitable distribution of wealth and, what is still more vital, the equality of opportunity both of individuals and concerns: it also affects the quality and quantity of those commodities and services which constitute national wealth. It has both its beneficial and sinister aspects. In the hands of society, it is an instrument by means of which invention is encouraged, literary production stimulated, and the consumption of dangerous commodities safeguarded; in the hands of the unscrupulous, it becomes an instrument for extortion whereby the consumer is mulcted by exorbitant prices or for the crushing of the small producer through unfair methods of competition. Though all of these may finally be resolved into the means to, or the result of, monopoly power over price, they give rise to different forms of monopoly, various separate problems, and considerations of legal control and public policy.

Classification of Monopolies.

Monopolies have been classified in various ways. The many different kinds of monopolistic agencies may be grouped under the following heads:

Legal monopolies: public and private.
Natural monopolies: of situation, personal, organization.

This classification divides monopolies into two groups—those whose monopolistic power is derived by an exclusive grant of the sovereign power or state and those which do not owe their monopoly power to any particular grant but from powers inherent in themselves, due to their possession or control of natural resources or due to the nature of their organization. The older concept of monopoly was that of an exclusive right granted by the sovereign power to an individual or concern to make and sell a certain commodity or perform a specified service. Monopolies of this kind have been in existence for thousands of years. Records of them have been found in ancient excavations, and they have been common all through history. The more modern forms of monopolistic agencies have come about often in spite of government action and largely owe their power to the evolution of business organization, as we have seen. They are not absolute monopolies, as are the former, but they do possess monopoly power in varying degrees. The modern idea of monopoly has been extended to include organizations or individuals who by virtue of their control over supply are able to regulate the price. It is not necessary to have exclusive control. It is usually considered that a control of 70 per cent of the production will enable a concern to regulate the price of a commodity in any industry, though less than this is often sufficient; there is no definite percentage. The term "monopoly," as it is used in modern times, is apt to refer to partial monopolies of this type. Both types, however, exist today side by side, and some monopolies are compounded of both types, being, at the same time, legal monopolies and monopolies of organization. A brief examination of the above forms will afford us a survey of the field of modern monopoly.

Private Legal Monopolies.

Private legal monopolies exist in three forms—patents, copyrights, and exclusive franchises granted to private individuals and corporations.

Patents are issued by the United States government through

the Patent Office to inventors of machines or processes, giving them the exclusive right to sell and manufacture their devices for a period of 17 years. At the expiration of this time, anyone may engage in the manufacture and sale of the device. During the year 1925, there were 49,540 patents issued by the U. S. Patent Office, and up to December, 1925, there had been a total of 1,577,996 patents issued. The granting of monopolies in the form of patents is justified on the grounds that it is necessary for the encouragement of invention and the application of science to industrial arts. It is an incentive to invention and a means of promoting progress. Society at large benefits from the productive devices originating from the fertile brains of scientists and inventors. By giving him a preferred claim on the products of his brain, society seeks to assure the inventor a reward for the services which he performs. But there is many a slip 'twixt cup and lip, even though society does its best to guide the cup. Before an invention can reap a profit today it must be manufactured and marketed often on a large scale; in so doing, it passes out of the realm of invention into that of business, to which the inventor is often a stranger and stands in danger of losing control of his invention. It is doubtful if any law could absolutely guarantee the inventor his reward. The modern inventor, however, is not the dupe which he used to be. He is apt to be a corporation or an integral part of it. Invention today is becoming an organized affair, and the invention or research departments of our large corporations carry on the work of invention on an organized basis. The typical inventor of today is no longer to be found starving in a garret but is a regular employee on a regular payroll of a corporation and often an employee of no mean importance.

Our patent laws have been criticized on other grounds. Sometimes, by "tying contracts," an inventor was enabled to extend his monopoly to other articles used in conjunction with his patent. Such contracts are now illegal by virtue of the Clayton Anti-trust Act of 1914. Large corporations have been accused of buying up patents for the purpose of pigeonholing them. To what extent this has been done is hard to say. Sometimes, the only market for an invention is an establishment already holding a monopolistic position in an industry. This may be the

case with an improvement to a machine or an accessory machine. The effect of the purchase of the new invention is to perpetuate an already existing monopoly. Perhaps the most serious menace today lies in the possibility of the basic patents in an industry's coming under the control of a combination. This has occurred in the shoe-machinery industry. The United Shoe Machinery Company organized in New Jersey, in 1899, was a consolidation of the Consolidated and McKay Lasting Machine Company, the Goodyear Shoe Machinery Company, and other companies, which together controlled the patents of machines used in fastening the soles to the uppers, called in the trade "bottoming-room machines," without which factory shoes cannot be profitably made. Other companies have since been added. The stock of the American Shoe Machinery Company was acquired by a holding company, the American Shoe Machinery Corporation, organized in 1905. This company dominates the shoe-machinery industry by virtue of its control by means of patents of the machinery necessary to manufacture shoes. Whether this concentration of patent monopoly power in one industry has encouraged invention or not seems to be a matter of doubt. Members of the shoe-manufacturing industry have testified on both sides of the question. There is no doubt but that the machinery put out by the company is efficient. But it has been claimed that the chief improvements were made prior to the organization of the combination. The company claims that it has spent from $250,000 to $750,000 on the development of new machines every year since it was formed. It also maintains that a greater number of practical patents in shoe machinery have been made effective since its organization than in a like period before. It has been claimed that a monopoly of the machinery in the shoe industry, and in any other industry, therefore, is likely to discourage invention, since there will be no competition for the product of the inventor, and his reward will, therefore, be limited. This has certainly not been the case in the telephone industry. In order to lessen the likelihood of undesirable monopolistic control's arising out of patents, it has been suggested that the time limit be reduced from 17 to 10 years, with permission to renew for five or 10 years more, if the public interest justifies it.

On the same grounds that patents are granted to inventors, copyrights are issued to authors and artists entitling them to the sole right to publish and sell literary productions and works of art including motion pictures. Copyrights are issued for a period of 28 years, with the privilege of renewal for another 28 years by the author or his heirs or executors. Monopoly is here used to stimulate and reward literary and artistic production. Trade marks are akin to patents and copyrights in that no one else but the owner may legally use them. They do not result in monopoly power in conducting business, they are used in competitive business, though they may tend to confer a degree of monopoly power on an otherwise competitive article. A trade mark is a mark of identification of a commodity or service, distinguishing it from other like commodities. They may be registered under the Trade-mark Law of 1920. In 1925, there were 13,840 so registered. They cannot be patented. Registration safeguards ownership, showing that the mark was used at a certain date by the individual or corporation registering it. Registration does not constitute *prima facie* evidence of ownership.

The third form of private legal monopoly is the exclusive franchise whereby a municipal, state, or national government grants certain privileges or rights to conduct business of a quasi-public character to a private individual or corporation. Such rights may consist of the right to lay rails for a street-railway line, to erect telephone poles, water mains, gas pipes, or to produce some product or service which cannot be produced efficiently under competition. To have two street-railway companies operating along the same streets or two gas companies serving the same district would not only involve a wasteful duplication of plant and equipment but might also be physically inconvenient or impossible on account of lack of space. Such businesses are usually natural monopolies of organization, producing commodities or services which are not able on account of the nature of the work to be efficiently carried on under competition or which are much more efficiently engaged in under a unified control. They often, moreover, involve certain privileges or rights of a public nature for their operation, such as the right of eminent domain. For these reasons, it is both neces-

sary and expedient to confer monopoly powers in the form of franchises on companies engaged in performing services of this nature. Railroads, street-car companies, water, gas, and electric companies, telephone companies, and public-utility companies, in general, are examples of concerns enjoying monopoly powers in this form. One valid criticism which has been made in regard to the granting of franchises in the United States is that they extend over too long periods of time. Municipalities and states have, by granting valuable franchises to private corporations for long periods of time, such as ninety-nine years or even more, lost control over valuable rights and permitted the establishment of permanent monopolies to private corporations, which have used or abused their power to swell their own profits rather than to render adequate service to the public. It would seem to be much wiser to follow the custom of European countries, which have enjoyed a lengthy and successful experience in dealing with public utilities, and shorten the length of time for which they are extended. Also, as franchises are contracts between a public body and a private company, to insert such clauses in the contract as will protect the future interests of the public by insuring adequate service. As franchises give monopoly power to a private company or individual for the performance of an essential service, the interests of the public make necessary some control over the operation of the company. This is usually accomplished by a public-service board or commission invested with certain powers over the quality of the services and the rate of charges to the consumers. The functions of such a commission consist of securing adequate service to the public at reasonable rates and, at the same time, assuring the company a fair rate of return on its capital.

Public Legal Monopolies.

The government may reserve for itself the right to manufacture and sell some commodity or service. The reason for such action may be the desire to secure the revenue from the undertaking, in which case it is sometimes termed a "fiscal monopoly." The tobacco monopoly in France is an example of a monopoly primarily for the sake of revenue. Purely fiscal monopolies seem to be rare in the United States. Usually, public enter-

prises of this nature are undertaken for the benefit of the community or for the welfare of the nation at large. It may be for the sake of national defense or security, which was the dominating motive in the nationalization of railroads in Germany. Sometimes it is the control of a dangerous commodity, such as caused the Scandinavian government to institute the Gothenburg system, whereby it secures a monopoly of the sale of distilled liquors. Or it may be the performance of some vital service to the nation at large, which would not be undertaken in its initial stages or could not be performed so efficiently through private competitive enterprise as under a unified control, such as is afforded by the national government. The U. S. Postal Service is an example of such a public legal monopoly. The government-owned roads of Canada were built to develop the resources and promote commerce throughout the far-flung provinces of the Dominion. The greatest field for public enterprise of this nature, however, lies in our cities and municipalities. In Great Britain, Germany, Holland, and other European countries, municipal enterprises covering a wide range of utilities are in successful operation. These are usually natural monopolies of organization, enterprises which cannot be carried out so well under competition but which are naturally most efficiently carried on by one unified company. They are usually limited to supplying essential commodities or services for the community, such as water supply, gas, electricity, street-railway service, recreational facilities, etc.

On the border line between public and private legal monopolies are those cases of public ownership and private operation. Many of the subways and elevated lines in big cities like New York and Philadelphia are owned by the municipality and leased for operation to a private company. Street-car lines are sometimes operated on this basis.

Natural Monopolies.

We now come to those kinds of monopolies which derive their monopoly power not from any government grant but from elements arising out of their own condition. The first group has been termed "monopolies of situation." Certain monopolies owe their power, in part and often solely, to their ownership or con-

trol of some natural situation, such as a water-power site, natural harbor, mineral springs or other limited natural resources, or land site. The danger arising out of the monopolistic control of certain of the limited natural resources and power sites in this country has been the source of grave concern to those responsible for and interested in the welfare of this great nation. With the growth of large-scale organization, the possibility of such a control has, during the last thirty or forty years, made itself apparent. When an important natural resource is concentrated in one locality, its ownership or control by one corporation or combination of corporations is greatly facilitated. Such ownership or control gives rise to monopoly power of no mean order. The outstanding example of such a monopoly in the United States is in the production of anthracite coal. The bulk of the 50,000,000 tons of anthracite produced each year is used for domestic consumption and is distributed all over the United States. Nature, however, has confined the supply of it to five counties of northeastern Pennsylvania. The anthracite industry is confined to one small section of the country. When an industry is concentrated in one locality, there will be a tendency in the beginning, on account of the closeness of competitors, to acute competition. Competitors, being so close together, will be more likely to bump into each other. As this is more or less a painful process, the same propinquity will later promote cooperation and combination, which are much more profitable, and the natural result will be monopoly. Ever since 1873, when the first combination was formed, there has been a continuous process of combination in the anthracite industry, culminating, in 1901, in a combination headed by the Reading Company, a holding company controlling several railroads and mines, which gave the combination control of two-thirds of the supply of unmined anthracite and a third of the shipments. Other coal companies and railroads were added. This concentration of control not only of the production but also of the chief agencies of transportation in the anthracite region gave the Reading Company a virtual monopoly of the anthracite-coal industry. This company was later dissolved by order of the Supreme Court.

It is not necessary that a resource be concentrated in one locality, but when it is so localized, its control by one large cor-

poration, or by several large concerns, through interlocking directorates or, what is more effective, a community of interests through common ownership of stock is more likely to be brought about. That the ownership or control of a natural resource is a common source of monopoly power will be evident to any one who studies the concentration movement in the United States during the past thirty or forty years. In most of the cases that have appeared in the courts, the ownership or control of raw materials has been one, and often a prominent, point of issue respecting the monopoly power wielded. Monopolies of situation are not confined to those concerns whose power springs from their situation in respect to some natural resource or site. As Clay, the English economist, points out, "The condition that most favors monopolistic combination is some natural or social limitation on the number of firms engaged in the industry." Localization of production or the market, as well as of the raw materials, renders competition keen, combination easy, and tends to monopoly or a monopolistic power over price through combined action.

The control of his own peculiar ability or personal service which an individual may possess is usually said to constitute a "personal monopoly." There have been many singers but few gifted with a voice like Caruso or endowed with the divine tones of Galli-Curci; many actors but few possessing the dramatic power of George Arliss or John Barrymore; few so gifted in the dance as Anna Pavlova or so skilful with the violin as Fritz Kreisler; of popular humorists there are few with the versatile powers of Will Rogers; and though the firmament of the movie world is studded with stars, the number is limited of those who can reenact on the screen the stirring events of the West that is gone and handle a gun with the same facility as Jack Holt or charm the masses with her personality as does Norma Talmadge. The large incomes enjoyed by artists of this magnitude are not due to the fact that they possess unique or unusual abilities, for there are thousands of actors and a multitude of singers; it is due, rather, to the unusual degree to which the few possess the talent that is common to the many. In all the professions, monopoly incomes are enjoyed by those at the top and for the same reason. Distinguished ability in any profes-

sion, inseparable as it is from its owner, identified as it is with his name, becomes a source of monopoly power as real as a patent and much safer because less easily parted with. And so it is in law, medicine, engineering, accounting, or advertising; we find certain individuals who, by virtue of extraordinary natural abilities or extraordinary training or both, are the happy recipients of incomes from personal monopolies.

The development of the corporation form of organization has permitted the organization of a large and complex series of operations, the direction of large masses of men, money, machinery, and materials, to be carried on under a unified control. We have seen how, by a process of evolution, in manufacturing industries operating under the law of decreasing cost, competition tends to combination, and combination results through large-scale organization in varying degrees of monopolistic control and, in some instances, in the formation of large monopolies or trusts. There is no doubt but that in manufacturing industries efficiency sets a limit to the size of the single organization, so that the resultant of this movement in the manufacturing field need not be the formation of giant monopolies but a general growth in the size of manufacturing concerns, brought about by internal growth or by a process of combination. This is what we see taking place all about us today. The majority of the consolidations and combinations that are taking place in manufacturing industries do not result in the creation of monopolies. They do lead, in certain industries, to the formation of a few large concerns who may, by informal agreements brought about in devious ways, by a community of interests through common stockholders, by joint action through trade associations, and in other ways, be able to exert a very subtle and real control over prices in their industry. The large financial holding companies, brought about by a process of "pyramiding" and mainly for the purpose of financial control, should be distinguished from the main body of industrial organizations based upon economy of operation.

There remain other industries possessing certain characteristics which make competition either impossible or undesirable and their conduct under a unified control the most effective method of conducting production. Such are the railroads, the

telephone industry, light and power companies, and the municipal state and national utilities, in general. These are typically natural monopolies of organization, and for this reason have been granted monopoly powers by the government. We have already treated some of these under the head of private legal monopolies. The history of railroads has conclusively shown the wastes of competition and the necessity of unified control in the operation of railroads. The railroad industry, because of the large proportion of fixed to operating costs, is, *par excellence*, an industry of decreasing cost. Competition has shown itself in unfair practices, secret rebates, rate discrimination, and wasteful duplication of equipment and has led to pools and combinations of all kinds. Throughout a long period, the government attempted by legislation to enforce competition and prevent combination in railroad operation. This attitude has completely changed, and enlightened public opinion recognizes and legislation is framed upon the assumption that the railroads are most efficiently operated under a unified system of control, that they are natural monopolies of organization. The Transportation Act of 1920 permits pools and combinations by railroads when authorized by the Interstate Commerce Commission, and even enjoins the commission to enforce joint action by the railroads, when it considers such combination advisable. Federal control of the railroads began in 1887 by the passage of the Interstate Commerce Act, whereby the Interstate Commerce Commission was created, with certain powers, for the purpose of regulating and controlling the railroads of the nation. By various other acts since, culminating in the Transportation Act of 1920, the powers of the commission have been extended, giving them control of rates and services, of new financing and issue of securities, of the making of extensions and branch lines.

Public-utility power plants engaged in the production of electricity afford another example of natural monopoly. The electric-power industry is one, again, with large fixed costs operating under the law of decreasing cost. One large plant is able to serve a city or community more efficiently and cheaply than two or three smaller ones. The leakage in transporting electric current is being gradually reduced, and it is now possible to transport power up to distances of 500 miles. Production in

small local plants is giving place to the generation of power in huge central plants. By linking together these huge central plants in one system, certain economies of operation, such as equalizing loads, have been achieved, and in the last twenty years, rates for current have been reduced. It is an industry where both large-scale production and large-scale organization result in better service and lower cost. The industry has developed through private enterprise, though it involves the granting of extensive public privileges and the control of valuable public resources. It is producing and distributing, through its network of power lines rapidly extending over the whole continent, a new and superior form of heat, light, and power, which is destined to play a vital part in the development of the nation's industries and in heating, lighting, and reducing the labor in innumerable homes. Its activities and operations are regulated and controlled by means chiefly of state commissions.

Still another outstanding example of a natural monopoly of organization is the telephone industry—not by virtue of the fact that it is an industry of decreasing cost, for it is claimed that the cost of service increases as the size of the local operating unit grows. But when long-distance service is taken into account, a great increase in cost of equipment is incurred, necessitating a large amount of fixed capital. The Bell system, in order to make that intercommunication possible, owns property and other assets—that is, switchboards, buildings, pole lines, conduits, etc.—that have cost over $2,800,000,000. Efficient telephone service either in one community or in the nation at large is not possible with two or more competing companies. The principle of two companies rendering telephone service in the same community is economically unsound. The public does not have the choice between two complete services, but it either pays to one company for a partial service or to both companies in order to secure a complete service in one community and suffers considerable inconvenience, besides. It took the public a long time to realize this, and during the first five or six years of the century there was considerable opposition on the part of legislatures and the public to the development of a national system, such as we now have, and considerable competition existed; in

1905, there were about as many independent telephone stations as there were stations operated by the Bell Company. There are still 9,000 independently owned telephone companies, together with 29,000 rural lines and systems, which are connected with the Bell-system lines for the interchange of toll calls, thus making possible an intercommunicating telephone system for over 70,000 cities, towns, and rural communities in America. It is evident that without their connections with the Bell system, these independent companies would be marooned. A complete and nation-wide telephone service is possible only under one centralized control, and that the United States possesses in the Bell system, which includes the Western Electric Company, which manufactures the apparatus; the Bell Telephone Laboratories, which carry on the research and experimental work; 25 operating companies in 16 operating organizations; the Bell Telephone Securities Company, which markets the securities of the company to the public; and the work and functions of all these are coordinated and controlled by the parent company, the American Telephone and Telegraph Company. It is partly under the control of the Interstate Commerce Commission, which has control of the accounting systems of the telephone companies. As it furnishes, sometimes, a strictly community service and, also, a state service and an interstate service, its charges are regulated occasionally by communities, occasionally by states, and occasionally by the Interstate Commerce Commission, according to the laws of the states and the nation.

LEGISLATION FOR THE RESTRICTION AND REGULATION OF INDUSTRIAL MONOPOLY IN THE UNITED STATES

Monopolies have never been popular. The animus against them is of ancient origin and has been evident all through history. The early monopolies were in the form of rights granted by the sovereign power to individuals, often based on nepotism and usually resulting in abuse of the power bestowed and in extortion. It is small wonder, then, that in the beginning of the industrial-combination movement which occurred in the late 'eighties, resulting, as it did, in ever and ever larger organizations of size and power hitherto unknown, the public should

look upon them with fear and mistrust and clamor for legislation restricting their size and severely regulating their activities and powers, with but slight regard to any injury that might be sustained by the concerns proceeded against or to any interference with their powers to produce. The earlier legislation passed, both in the industrial and in the public-utility fields, was inspired largely by fear of the unknown and based on the blanket assumption that monopoly was dangerous and must be downed and that competition must be maintained at all costs. And even in the railroad field, where competition had by this time proved itself impracticable, and a unified control desirable and even necessary, recognition was grudgingly given, as was shown by the Interstate Commerce Act of 1887, which still sought to preserve competition and jealously guarded the powers of the railroads to combine and unify their lines. The Transportation Act of 1920, as we have pointed out, displays an entirely different attitude, by completely recognizing the undesirability of competition and the necessity of combination and unified control of railroad operations. A like discrimination has taken place in legislation affecting public utilities in general, a recognition that competition is undesirable because inefficient, that they are natural monopolies best conducted under a unified control. State laws, instead of prohibiting, permit them, then seek by regulation to prevent any abuse of monopoly power in the charging of higher rates than are justified by a fair rate of return on the capital invested. Public opinion concerning monopoly in the industrial field during the last thirty years has shown some modification as reflected in more recent legislation. There is evident a tendency to discriminate between mere combination for the purpose of, and resulting in, certain economies of operation and a combination in restraint of trade. More recent legislation, instead of blindly smashing at all combinations, has sought to provide machinery enabling the law to discriminate on economic grounds between desirable and undesirable combinations, in order that the public may benefit by the economies of the one and be preserved from the dangers of the other. The law has by no means let down the bars to monopoly in the field of industry. It has adopted a more constructive attitude toward large-scale organization in the industrial field

and has evidenced a desire to pass laws and interpret them in harmony with unmistakable economic tendencies.

Laws restricting and regulating monopolies have been passed both by the separate states and by the federal government. During the late 'eighties and the early 'nineties, a mass of legislation was passed by the states suppressing trusts, pools, and other combinations. The individual states soon found themselves incompetent to cope with these organizations engaged in interstate commerce. The lack of uniformity of state laws proved a hindrance to the legitimate activities of enterprises engaged in it. The problem early proved itself to be one calling for federal control as well as state regulation. Federal legislation dealing with industrial combinations and monopolies began with the passage of the Sherman Anti-trust Act of 1890. In 1914, the Clayton Act and the Trade Commission Act were passed; and in 1918, the Webb-Pomerene Act, dealing with combinations engaged in foreign trade.

Sherman Anti-trust Act of 1890.

This famous statute is entitled "An act to protect trade and commerce against unlawful restraints and monopolies." The first two sections state in terse language the chief purpose of the act:

Sec. 1. Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several states, or with foreign nations, is hereby declared to be illegal. Every person who shall make any such contract or engage in any such combination or conspiracy shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding five thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Sec. 2. Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several states, or with foreign nations, shall be deemed guilty of a misdemeanor, and on conviction thereof, shall be punished by fine not exceeding five thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

The act provides that the government may bring criminal

prosecution against persons violating its provisions, or it may institute proceedings in the circuit courts to prevent and restrain violations of its provisions.

The Sherman Law in Action.

The courts have hesitated to take criminal action under the Sherman Act, on account of the abstract nature of the charge. No one has been flung into prison under the act for restraint of trade, though some have come uncomfortably near it, as in the National Cash Register case. The chief results of the act have been obtained from suits for the dissolution of unlawful combinations. It was not, however, until the administration of President Roosevelt that the power of the Sherman Act was proved. In his vigorous hands it became a weapon by no means to be ignored, and he demonstrated that the law could be used to check undue and unfair monopoly power.

The first dissolution brought about under the Sherman law was in the case of the Standard Oil Company of New Jersey. By the decision of this case, the so-called "rule of reason" was established. Under the earlier decisions, all combinations "in restraint of trade" were illegal. The decision in this case made the law turn on an "unreasonable" restraint of trade. A restraint of trade not unreasonable, and which was incidental to a lawful purpose, as under the common law, was not to be considered unlawful under this act. In this case, also, the court gave much weight to unfair methods of competition as evidence of unreasonable restraint and monopolistic intent. There is doubt as to whether the dissolution of the company resulted in restoring competition between the constituent corporations. The Federal Trade Commission, as a result of its investigation of this dissolution, states that there was little if any, competition among the former subsidiaries of the Standard Oil Company of New Jersey in the marketing of gasoline. According to the commission, this was due to the fact that there was a community of interest among these companies based on common stockholdings. The commission concluded that the company remained a combination in fact if not in law, a combination based on a community of interest, which itself was based on interownership

of stock.[1] Had the stock been distributed in such a manner as to prevent the common ownership of stock among the subsidiaries, instead of pro rata, as was the case not only in this dissolution but also in the Northern Securities Company and the Tobacco trust, these dissolutions would have been much more effective in establishing competitive conditions.

The decision in respect to the International Harvester Company brings out another interesting point in the application of the Sherman Act. The dissolution of this company was ordered by the circuit court in 1914. The company controlled from 80 to 85 per cent of the business in its industry. It was not accused of using unfair methods or of attempting to suppress competition. Its earnings were moderate, the decision was based on the amount of business controlled by the company. Judge Sanborn dissented from this decision on the grounds that there had been no "unreasonable" restraint of trade by raising prices, limiting production, deteriorating quality, decreasing the prices paid for the labor or materials required to produce with, or repressing competitors. The company appealed its case to the Supreme Court. Owing to the war, the case was delayed and finally withdrawn by the company. An understanding was reached with the Department of Justice in 1918, the suit was dismissed, and the dissolution proceeded.

The decision of the Supreme Court rendered in 1920 in the case of the Steel Corporation indicates a desire on the part of the courts to interpret the law in the light of public policy. It was decided that the corporation did not possess a monopoly, though it did hold a powerful position in the industry. It had engaged in combinations with its competitors through pools, associations, trade meetings, and dinners, which, though illegal, were temporary and had been discontinued. It had not played unfair with its competitors, it was large, but the court did not hold that size, unless accompanied by repressive acts, was ground for dissolution. It declared:

> We are unable to see that public interest will be served by yielding to the contention of the Government respecting the dissolution of the Company . . . and we do see in a contrary conclusion a risk of

[1] *Report* of Federal Trade Commission on price of gasoline, 1915.

injury to the public interest, including a material disturbance of, and, it may be serious detriment to, the foreign trade.

The Sherman Act has been criticized because of the general terms in which its purpose is stated. Business concerns have complained that they do not know where they stand under the act. The phrasing, no doubt, was purposely broad. Too specific wording of its purposes would have limited the application of the law. The meaning of the law seems clear. Its application is left to the interpretation of the courts. It aims to prevent unreasonable restraint of trade by monopolies or monoplistic concerns and renders illegal any and all undesirable practices arising therefrom. Its history has shown that its effectiveness varies according to the attitude of the government or the courts from time to time, and behind this is public opinion. It also demonstrates that in the hands of an active administration it can be used as a check to undesirable monopoly power and unfair monopoly practices. Later legislation supplementing its powers has increased its effectiveness.

Clayton Anti-trust Act.

The Clayton Act was signed by President Wilson, Oct. 15, 1914. Its chief provisions may be classified under three heads: (1) a group of positive prohibitions against unfair practices; (2) remedies for these; (3) labor provisions.

It prohibits the acquisition by one corporation of stock in another, when the effect may be substantially to lessen competition between such or tend to create a monopoly. It prohibits "interlocking directorates" in competing corporations. Tying contracts which bind the purchaser, or lessee, of certain commodities to buy or use certain other commodities exclusively are declared illegal, where the effect is such as substantially to lessen competition or tend to the creation of a monopoly. It prohibts any person engaged in commerce from discriminating in price between different purchasers of a commodity, where the effect may be substantially to lessen competition or tend to create a monopoly. Discriminations may be made for differences in grade, quality or quantity sold, or in the cost of selling or transportation, or when made in good faith to meet competition. It per-

mits a seller to select his customer in bona fide transactions but not in restraint of trade. In order to remedy the foregoing practices, the Interstate Commerce Commission is charged with the enforcement of the specific provisions when they apply to railroads, the Federal Reserve Board in the case of banks, and the Federal Trade Commission when they apply to industrial corporations. The act also specifies that any person injured by anything forbidden in the anti-trust laws may institute suit and recover threefold damages and that the proceedings of a court decision establishing a violation of the trust laws may be used as *prima facie* evidence by the private suitor against the same concern. The act also contains provisions for the purpose of preventing labor organizations from being construed to be illegal combinations or conspiracies in restraint of trade under the Sherman Act. It also limits the use of the injunction in labor disputes. Section six declares, that "the labor of a human being is not a commodity or article of commerce." Strikes, picketing and boycotts are declared legal if peacefully carried on.

The Trade Commission Act.

This act, passed, also, in 1914, provided for the creation of a Federal Trade Commission of five members to be appointed by the President with the advice and consent of the Senate. The commission succeeded the Bureau of Corporations created in the Roosevelt administration, which at the appointment of the commission ceased to exist. The principal powers of the commission may be classified under two heads: (1) investigation; (2) the prevention of unfair methods of competition.

The commission was given wide powers of investigation into all corporations engaged in commerce, other than banks and common carriers. It was also empowered to investigate all corporations—banks and railroads included—guilty or alleged to be guilty of violating the anti-trust laws. It may gather information and investigate the organization, business, conduct, or practices of any corporation other than a bank or common carrier. It may require under oath reports or answers to specific questions in writing. Furthermore, it may be required to make investigation into the affairs of any corporation or individual violating the anti-trust laws if requested by the attorney general.

These provisions enable the commission not only to secure information of value to the government when prosecuting corporations under the Sherman Act but also to collect a body of valuable data on business practices and conduct for public use. The latter function is widened by the power of the commission to secure information concerning trade practices in foreign countries with a view of keeping congress informed as to the effect on American commerce of foreign trade practices.

The commission may be called upon to act in an advisory capacity to the attorney general and advise the courts in regard to the readjustment of the business of any corporation alleged to be violating the anti-trust laws. Upon request of the court, they may be asked to prepare an appropriate form of decree in any suit of equity under the anti-trust laws. The courts may adopt or reject their recommendations as they think fit. The dissolution of a trust like the Standard Oil Company, referred to above, is primarily an economic problem rather than a purely legal one and involves a comprehensive knowledge of business organization and practices. A body of economic experts such as is the Federal Trade Commission, with the power to investigate the innermost workings of business organizations in American business and engaged as it is in making a continuous study of business methods and practices, should be in a position to render the Department of Justice valuable technical advice in the reorganizations of corporations in cases of dissolution. The commission is also able to assist the courts in bringing about voluntary reorganizations, in the cases of concerns who wish to avoid court proceedings and to bring their affairs in harmony with the law. This prevents delay and expense and enables business concerns to receive some assurance that they are working along legal lines and will not be proceeded against by the Department of Justice.

The commission is empowered to prevent unfair methods of competition, when these are against the public interest. The following unfair practices have come under the ban of the law: (1) cutting prices in a given locality to crush competition; (2) exclusive dealer agreements, whereby dealers who refuse to handle the goods of one company exclusively and throw out competitive lines are discriminated against by the charging of higher

prices; (3) the use of threats and other forms of intimidation; (4) the use of fighting brands for the purpose of ruining competitors; (5) the employment of spies to secure information concerning the business of competitors; (6) the organization of bogus companies posing as independents used to fight competitors. The commission may investigate any concern which it has reason to believe is engaging in unfair methods injurious to the public interest or concerning which it has received complaint from some party claiming to be injured; it may issue a complaint stating its charges and appoint a given time for a hearing. If at such hearing the commission is convinced that the method in question is against the law, it shall make a written report of its findings and may issue an order to the company to desist. Should the order not be obeyed, the commission may apply to the circuit court of appeals, in any circuit where the method in question was used or where the corporation carries on business, for enforcement of its order. The case then is decided by the court. The power of the commission to act on the complaint of a concern claiming injury from an unfair method of competition and its ability to issue an order to desist afford immediate relief to the small competitor and save it the expense and injury of a long-drawn-out lawsuit. The power to investigate and publish the facts ascertained acts as a deterrent to unfair practices, and the law is provided with specific facts on which to base its decisions.

The Webb-Pomerene Act.

The Webb-Pomerene Act was passed in 1918 to promote export trade in the United States by legalizing combinations for the express purpose of exporting commodities. This was deemed advisable, to enable American manufacturers successfully to compete in foreign trade with powerful foreign combinations often aided by their respective governments. Germany, for example, by means of her cartels has greatly extended her activities in foreign markets. The large concerns of the country do not need this power, as they already possess marketing facilities sufficient for their purpose. The smaller concerns may be able by combining in export selling associations to increase their

foreign sales. There has been some apprehension lest the bill should be used as a means of restricting competition in the domestic market.

Summary.

Monopolies may be grouped under two heads: legal monopolies, which arise as a result of an exclusive grant by the sovereign power or state, and natural monopolies, which derive their power from natural conditions under their control. Private legal monopolies comprise patents, copyrights, and franchises. Patents and copyrights are granted to inventors, authors, or artists to stimulate invention, literature, and art by assuring to those who do creative work in these fields a prior claim on the returns. Franchises are government grants to private individuals or corporations to engage in the production of some essential commodity or service, which can be produced to better advantage to the public interest as a monopoly rather than under conditions of competition. Street-car companies, water companies, gas and electric companies are examples of concerns enjoying such monopolies. The government may reserve to itself the sole right to produce and sell some commodity or service. Such is termed a "public monopoly." Public monopolies may exist for the sake of revenue, or they may be undertaken for the public welfare or because it is thought that the service can be performed more efficiently by the government. The U. S. Postal Service is an example of the latter type. The salt monopoly of the French government is an instance of a "fiscal monopoly." "Natural monopolies" of situation are those deriving their power from the exclusive control of some natural site or resource. The anthracite-coal industry in the United States is an example of an industry in which monopoly power has been prevalent by virtue of the control over a natural resource confined to one small section of the country. Personal monopolies are enjoyed by individuals by virtue of their unusual abilities. The operations in some industries are most advantageously carried on under a unified control through one large organization or several. Competitive operation involves waste. The development of the corporation form of organization has made it possible to unify such

extensive operations under one management. Such concerns are called "natural monopolies" of organization. Railroads and public-utility companies, in general, are examples of such. In these fields, competition is wasteful and operations are best carried on through the agency of monopolies. In the manufacturing industries and the general industrial field, though there is a tendency to a unified control of operations under large organizations, the economies so secured do not seem to necessitate the existence of organizations large enough to monopolize whole industries. Large organizations, much larger than any other system of industry in the past has witnessed or demanded, are evolving out of our present system of mass production and should be permitted, provided they are justified by real economies of operation.

The monopoly problem in a nutshell consists in prohibiting monopoly where undesirable because unnecessary and dangerous and properly regulating it when permitted so as to secure its advantages and yet protect the public from its dangers. In certain fields, such as the public utilities, monopoly is clearly to the public advantage. The granting of monopoly privileges in these fields, however, is apt to put great powers in the hands of individuals or corporations, not only of making monopoly profits but also of usurping public rights and wasting public resources, of withholding adequate service. Monopoly powers once granted necessitate control. Regulation by commissions is excellent when the men comprising the commission are honest, energetic, and expert. Unfortunately, the three are not always found in the same degree in the same individual. In the general field of industry where monopolies are not considered necessary to efficient operation, the law seeks to prohibit monopolies. This was the chief purpose of the Sherman Act. Later legislation has attempted to discriminate between monopolies and combinations of a size large enough to secure economies of operation yet not possessing undue monopoly power nor manifesting unfair monopoly practices. The Clayton Act and the Trade Commission Act were passed mainly for this purpose—to enable the law to discriminate between the good and the bad, that the economies of combination and large-scale organization might be secured and the dangers of monopoly avoided.

Test Questions

1. Distinguish private legal monopolies from public legal monopolies, and cite examples of each kind.
2. On what grounds are private legal monopolies justified?
3. Give examples of the different kinds of natural monopolies.
4. Explain the change which has taken place in public opinion in recent years in reference to monopolies.
5. Summarize the contents of the Sherman Act; the Clayton Act; the Trade Commision Act.

References

STEVENS, W. S. (Editor), "Industrial Combinations and Trusts."
JONES, E., "The Trust Problem in the United States."
JENKS, J. W., and CLARK, W. E., "The Trust Problem."
HENDERSON, G. C., "The Federal Trade Commission."
JONES, E., "The Anthracite Coal Combination in the United States."
WATKINS, M. W., "Industrial Combinations and Public Policy."

CHAPTER XX

MONEY

Money and Wealth.

No discussion of exchange and value would be complete without some explanation of the one thing by means of which today all exchanges are effected and in terms of which all values are expressed.

It has been truly said that

> Our society is built with money for mortar; money is present in every joint of circumstances; it might be named the social atmosphere, since in society it is on that alone that men continue to live and only through that or chance that they can reach or affect one another.

There is scarcely a want of civilized man but depends directly or indirectly on money for its fulfilment. It is the universal medium between desire and satisfaction, the golden master key of civilization, without which we may shiver, starve, or perish in the midst of plenty, possessing which all the rich stores of society's treasure troves lie at our disposal.

So closely allied to wealth is money that in the minds of many the two are synonymous. From serving as a means to wealth, money has become the symbol of wealth, and as a symbol it has usurped the place of the wealth which it symbolizes; the idol has become the god. In like manner, because capital goods are valued in terms of money and are obtainable only in return for money, in the minds of millions whose eyes fail to pierce beneath the surface, money constitutes the capital wealth of the country. This commercial idolatry of money distorts the truth in two ways: first, by exaggerating the importance of money; second, by ignoring the real nature of the service which it performs. In this chapter, we will examine the nature of money and the part which it plays in exchange.

What Money Really Is.

Modern society produces its commodities under a system of division of labor; division of labor necessitates exchange; exchange brings up the problem of value; exchange is facilitated and value simplified by the use of money.

Without exchange, division of labor would be impossible, and without money, exchange to the extent to which it is carried on today would be impracticable. Through the instrumentality of money society effects the myriad of exchanges on which its well-being depends.

Money, then, is, in reality, a tool; its use is to facilitate the exchange of commodities and services. It is a capital good, just as the locomotive is a capital good; and like the locomotive, it serves to transfer commodities from one place or person to another. The simplest and truest conception of money is that of a tool the purpose of which is to effect the exchanges necessary in modern society for the production and distribution of wealth.

The Functions of Money.

First and foremost, money acts as a medium of exchange. It is, perhaps, best defined as that thing which is generally acceptable as a medium of exchange and as a final payment for debt. Acting as a medium of exchange, it has become a standard of value. These are its two primary functions. As a result of these it also serves as a standard of deferred payments and a store of value, the former being particularly important in these days of long-time contracts. Such are the chief offices performed by money in its capacity as a tool for facilitating exchange.

Qualities of Good Money.

To perform these functions efficiently, that which is to serve as money should be generally acceptable, stable in value, portable, readily recognizable, easily divisible, homogeneous, and durable.

Of necessity, anything to become a medium of exchange must be generally acceptable. Tobacco, wampum, beads, or gold, each owed its election to the office of money first and foremost to its

being an object of general desire. The one reason why every man is not only willing but also anxious to exchange his particular products or service for money is because he knows that everyone else who has products for exchange is likewise willing to accept money in lieu of them. Just as soon as a commodity loses this quality of general acceptability, its usefulness as money ceases. This may happen even though it be issued by the government and declared legal tender for debt, as in the case of the greenbacks during the Civil War, which did not circulate as money in California for the simple reason that they were not acceptable to the people of that state, who preferred and used gold as money. The fundamental quality of a good money is general acceptability.

While, theoretically, it is not necessary that a commodity to serve as money should possess a value of its own apart from its use as money, in practice it has been found expedient to choose as money some commodity possessing a value independent of its monetary use. Pure paper money, termed "fiat money," owing its value entirely to governmental decree and control over the supply, may serve as money, as did the greenbacks from the time of the Civil War to 1879. Such money, however, has seldom proved satisfactory, and the monetary experience of nations has shown time and time again that to be generally acceptable money should possess value in the world at large, a value of its own apart from its use as money.

Not only so, but it is highly essential, also, since money acts as a standard of value and of deferred payments, that its own value should not fluctuate. Stability of value is a prerequisite of paramount importance in the commodity that is to serve as money.

The Survival of the Fittest.

It is easy to see why, of the many commodities that have served as money, the precious metals alone have survived and why, of these two, gold has almost ousted silver from the field. Gold is of universal acceptability; it possesses value all the world over outside of its use as money, being highly prized for its beauty in the arts, much desired as a mark of social distinction, besides being in demand for more utilitarian purposes, such

as dentistry. It possesses stability of value in a high degree, it is portable, easily recognized and, therefore, not easily counterfeited. Unlike its predecessors tobacco and wheat, it is of one grade. There is tobacco and tobacco, but gold is gold the world over. Lastly, it embodies value in a form about as imperishable as is possible; it will neither burn like paper, spoil like wheat, nor crush like a shell; an English gold sovereign, it has been estimated, would take 8,000 years to wear out.

The Relation of the Government to Money.

While in ancient times or in new communities a commodity might come into use as a medium of exchange of its own accord and maintain its position by habit or custom, as did iron and copper among the ancients and wampum and tobacco among the American colonists, the right of issue and control of the money supply early became the prerogative of the monarch or government, and among modern nations the selection and regulation of money and the monetary system has become one of the most important of government functions.

This does not imply that money becomes money merely by virtue of government decree or that the government is able to make anything money. As just explained, a commodity to serve as money must first be generally acceptable to the people; the sanction of the government clinches that acceptability; not only so, but also it is doubtful, owing to the dangers surrounding the issue of money, whether a money whose issue was not controlled and safeguarded by the government would be generally acceptable to the people at large.

So vital is money to the welfare of the nation, so essential to the smooth running of the industrial system, which, based on division of labor, demands, above all things, the free and unhindered circulation of products finished or unfinished through the arteries of commerce, that it has been found wise to place the tools and machinery on which this all at bottom depends under the control of the government.

Hence, in all modern nations the government chooses, regulates, and controls by law the money and the monetary system. The state selects the commodity that is to serve as money, decides on the quantity of it that will constitute the monetary unit, de-

termines the different coins into which it shall be coined, takes charge of the minting of these, declares them full legal tender for debt, which means that they must be accepted by creditors as legal payment for all debts expressed in terms of money. Thus, the state protects the contract of exchange, one of the most common as well as one of the most important of all contracts. In addition, it supplements this standard money with other forms, decides on the extent to which they are to be legal tender, and regulates their supply according to the needs of trade.

Adopting a Standard.

In selecting a commodity to serve as its medium of exchange and standard of value, a country is said to "adopt a standard." Thus, it is said that "in 1816 Great Britain adopted the gold standards and that most countries since then have gone on a gold basis." Each country has decided that a certain weight of gold, to which it gives a name, shall constitute its standard unit of value, just as the French government decided that the cubic centimeter of water should constitute its unit of weight, termed a "gram." Great Britain decided that its standard of value should be the sovereign and defined it as consisting of 123.27447 grains (7.98805 grams) of English standard gold or 113.0015 grains of pure gold. The United States calls its unit of value the "dollar" and defines it as consisting of 25.8 grains of gold nine-tenths fine. In the same manner, the franc of France and the mark of Germany signify certain weights of gold officially adopted by those countries as their standard units of value.

Coinage.

In olden times, the precious metals were actually weighed, and a pair of scales was part of a merchant's equipment. The names of many coins are, in fact, derived from the weights of the metals which they once represented. The shekel, the talent, the mark, the franc, the pound were all originally names of weights. The English "pound" sterling is derived from the Saxon pound of silver, the ancient standard of value of that sturdy race.

Later, the pieces of metal came to be stamped by the government, which saved the trouble of weighing and certified them

to be of correct weight and of the proper fineness. Thus, we have the coin which is, in reality, an ingot the weight and fineness of which are certified by means of some manner of design imprinted on its surface. The English sovereign, for instance, is a gold ingot stamped and guaranteed by the English government to contain 123.2744 grains of gold eleven-twelfths fine.

It is not even necessary that the standard unit itself should be made into a coin; it may serve merely as the basic unit of those coins which are issued. In the United States, for instance, no $1 gold pieces are minted and have not been since 1890, but the gold pieces that are coined are multiples of the dollar or unit, the $10 gold piece containing exactly ten times 25.8 grains of standard gold. Coinage today is simply a legal device for dividing the standard money metal into convenient units of certified weight and fineness.

Free Coinage.

While in olden times, the seignior or monarch made a handsome profit out of coining, called "seigniorage," most governments today make no profit; in fact, many make no charge for the expense of coinage, termed "brassage," but require merely a nominal fee for assaying and for the alloy used. This charge is so small that for all practical purposes we may say that most nations on a gold standard coin free of charge all gold brought to them. The United States, for example, stands ready to receive all gold bullion brought to its mints, returning to the bearers weight for weight of gold dollars.

Standard Money.

These coins are known as "standard money" in distinction from all other media of exchange of general acceptability which may be passing from hand to hand as money. For though a country adopts a certain weight of gold to be its standard unit of value and final medium of exchange and issues it in the form of coins, it supplements this standard money by other media of exchange of general acceptability, all of which are multiples or submultiples of the standard unit, and all of which are convertible finally into standard money.

In the strictest sense, a country on a gold standard has but

one kind of money, namely, gold; all other media of exchange only partially perform the functions of money, all derive their value and general acceptability from the fact that they are finally exchangeable for gold. This is the essential feature of the whole system; this is what is meant when it is said that a country is on a "gold basis." Apparently, there are in each country several kinds of money, each as generally acceptable as a medium of exchange, in fact preferably acceptable to gold. The fact of the matter is that all these other media of exchange are acceptable only as long as they themselves are exchangeable for the real medium gold. Let this convertibility be once doubted, and their acceptability and value will shrink like a pricked balloon. The naked truth is that gold alone is money in the strictest and fullest sense and all other media of exchange which pass as money within the country are simply representatives or auxiliary means of rendering gold more efficient.

In any country on a gold standard, gold coin is known as "standard money." Such money is the actual embodiment of the weight of gold officially selected to serve as the standard unit of value and final medium of exchange; all other money issued is expressed in terms of it or comparable to it and is finally convertible into it.

Supplementary or Auxiliary Money.

All other media of exchange of general acceptability, issued by the government or by banks under government supervision, act to conserve and augment gold and may be termed "supplementary" or "auxiliary money."

Such money may be classified under three heads: (1) bullion certificates; (2) government or bank notes; (3) token money.

Bullion certificates, such as the United States gold certificates, are analogous to warehouse receipts certifying that a specified amount of gold is deposited in the government vaults; they save wear and tear on gold and, being more convenient, are preferred in the great majority of transactions within the country to the gold coin itself to which the owners of the notes are entitled.

Government notes or bank notes are promises to pay standard money on demand. In Europe they are issued by banks; in the

United States, by both the government and banks. Their convertibility into gold is secured by a reserve of standard money —not a cent-for-cent reserve, as with United States gold certificates, but one which will be ample to redeem all of the notes that are likely to be presented at any one time. As experience has demonstrated that but a fraction of the notes will ever be presented for redemption at one time, a large volume of notes may be issued against a comparatively small reserve of gold. Such notes are not only a substitute for gold but also materially augment and increase the efficiency of gold, every gold dollar or sovereign in the vaults having several notes or bills representing it in actual circulation.

Token money includes the various subsidiary coins of baser metal issued by every country to supply its need for small change. The value of the metal in such coins is less than their nominal value; they serve as very convenient tokens of inconveniently small amounts of gold. They are issued by the government in limited quantities according to the requirements of trade and are also convertible into gold.

There is probably no other one thing which the average citizen of the United States desires more and knows less about than the money of his country. For the sake of better acquaintance, we will briefly describe the various members of our monetary family.

MONEY OF THE UNITED STATES

The table on following page lists the ten different kinds of money, with their respective amounts, which constitute the monetary stock of the United States.

Gold Coin and Bullion.

Of the $8,123,846,787 which constituted the monetary stock of the United States May 31, 1928, over $3,319,000,000 consisted of gold coin and bullion. During the last forty years, the country's stock of gold money has increased by leaps and bounds: In 1879, it was $245,000,000; in 1900, it had grown to $1,000,000,000; in 1910, to over $1,500,000,000; in 1916, to almost $25,000,000,000; while today, it exceeds $3,000,000,000 and constitutes about one-third of the gold monetary stock of the world.

CIRCULATION STATEMENT OF UNITED STATES MONEY

MAY 31, 1928

Kind of money	Total amount[1]	Money held in the Treasury	Money outside the Treasury	
			Held by Federal Reserve Banks and agents	In circulation
Gold coin and bullion	[2] $4,160,188,365	$3,319,354,208	$461,149,754	$379,684,403
Gold certificates	[3] 1,539,506,449	.....	526,367,595	1,013,138,854
Standard silver dollars	539,962,807	480,458,644	13,276,582	46,227,581
Silver certificates	[3] 467,886,964	.....	88,282,709	379,604,255
Treasury notes of 1890	[3] 1,304,850	.....	.....	1,304,850
Subsidiary silver	299,261,748	3,273,026	18,584,457	277,404,265
Minor coin	116,478,611	2,667,948	2,889,418	110,921,245
U. S. notes	346,681,016	4,499,870	45,992,019	296,189,127
Federal Reserve notes	1,955,839,180	1,302,945	367,560,753	1,586,975,482
Federal Reserve Bank notes	4,154,618	64,966	17,679	4,071,973
National Bank notes	701,280,442	18,075,453	34,652,708	648,552,281
Total, May 31, 1928	$8,123,846,787	[4] $3,829,697,060	$1,558,773,674	$4,744,074,316

[1] Includes United States paper currency in circulation in foreign countries and the amount held by the Cuban agency of the Federal Reserve Bank of Atlanta.

[2] Does not include gold bullion or foreign coin other than that held by the Treasury, Federal Reserve banks, and Federal Reserve agents. Gold held by Federal Reserve banks under earmark for foreign account is excluded, and gold held abroad for Federal Reserve banks is included.

[3] These amounts are not included in the total, since the money held in trust against gold and silver certificates and Treasury notes of 1890 is included under gold coin and bullion and standard silver dollars, respectively.

[4] The amount of money held in trust against gold and silver certificates and Treasury notes of 1890 should be deducted from this total before combining it with total money outside the Treasury to arrive at the stock of money in the United States.

Less than half of this stock of gold is in the form of coins. The gold coinage of the United States consists of quarter eagles ($2.50), half eagles ($5), eagles ($10), double eagles ($20), which are full legal tender for all debts public and private. The bullion referred to in the report consists of bars of gold, assayed of specified weight and stamped, which are more convenient than coin for export purposes and for reserves in the vaults.

The major part of this gold coin and bullion is in the possession of the government, part being held in the Treasury in trust for gold certificates, part serving as reserve in the Treasury or Federal Reserve banks, part belonging to the free fund of the

U. S. Treasury. The remaining 379 million dollars said to be "in circulation" serve for the most part as a reserve in the vaults of banks throughout the country.

Gold Certificates.

The Secretary of the Treasury is authorized to receive gold coin or bullion and to issue, in exchange for the same, gold certificates in denominations of from $10 to $10,000. The net amount of such certificates outstanding May 31, 1928, was $1,539,506,449. The gold deposited for such certificates is held in trust in the treasury vaults and may be claimed at any time by the owners of the certificates, which are but a convenient means of circulating this gold. These certificates are legal tender, are receivable by the government for all public dues, and may be counted by banks as part of their lawful reserve.

Silver Dollars.

The enormous stock of silver dollars in the possession of the United States is a heritage from the past, resulting mainly from the large supplies of silver purchased under the Bland-Allison Act of 1878 and the Sherman Act of 1890. By the Pittman Act of Apr. 23, 1918, which authorized the Secretary of the Treasury to melt and sell as bullion not in excess of 350,000,000 standard silver dollars, the supply was temporarily reduced by $68,453,583, making the stock of silver dollars at the close of the fiscal year 1918 $499,515,930, of which but 77,000,000 were in circulation, the remainder being held in the Treasury. In 1928, the silver coins increased in volume to $539,962,807. The silver dollar contains 371¼ grains of silver the value of which is considerably less than $1. While these silver dollars are not directly redeemable in gold, it has always been the policy of the government so to redeem them, and the act of 1900 which instructs the Secretary of the Treasury to maintain all forms of money at a parity with gold insures their redemption in gold beyond question and establishes them as token money with their value based on gold. They are full legal tender for all payments public and private except for interest on government bonds.

Silver Certificates.

Few of these clumsy silver dollars are in actual use; their circulation is secured by means of silver certificates, similar in nature and purpose to the gold certificates. These are issued, for the most part, in small denominations and have become the popular pocketbook money of the nation. They are not legal tender but are receivable by the government in payment of all public dues and may be counted by banks as part of their lawful reserves.

Treasury Notes.

The Treasury notes originated from the Sherman Act of 1890, 156,000,000 being issued by the government to pay for the silver purchased under that act. Each note represents so much silver stored in the Treasury vaults. They are redeemable in either silver or gold and when so redeemed are canceled, and if redeemed in gold, silver certificates are issued in their stead. These $1,304,850 notes are the sole survivors of a form of money that will soon become extinct. Treasury notes are legal tender except in payment of principal and interest of government bonds and lawful money for bank reserves.

Subsidiary Silver and Minor Coins.

Half dollars, quarters, and dimes are coined by the government as the country needs them and are shipped in exchange for other kinds of money or paid out over the counter, in the Treasury offices. The government, of course, makes a seigniorage on this coinage, which, in 1918, amounted to over $13,000,000. These coins are redeemable in lawful money and are legal tender for payments not exceeding $10.

Minor coins, 1 cent pieces, and nickels, not mentioned in the report, are also coined and distributed in the same manner as subsidiary silver and are in great demand. They are redeemable in lawful money when presented in sums or multiples of $20. Over $116,000,000 of these humble but hard-working members of the monetary family were outstanding May 31, 1928.

United States Notes (or "Greenbacks").

These were first issued by the government during the Civil War. The largest amount outstanding at any one time was $449,338,902, in 1864. By various acts of Congress authorizing the cancellation of these notes, the amount outstanding has been reduced to $346,681,016. This process of retirement was arrested by the Act of Congress of May 31, 1878, which ordered all redeemed notes to be reissued, and the outstanding amount has remained the same ever since. When first issued, the country had suspended specie payments, so that these notes were, to all intents and purposes, fiat money pure and simple. By the Resumption Act of 1875, the Secretary of the Treasury was ordered to redeem these "promises to pay" in coin; by the Act of Mar. 14, 1900, a special gold reserve of $150,000,000 was ordered set aside by the redemption of these and the remaining Treasury notes. They are issued in denominations as low as $1 and $2, but the majority are in the form of $5 and $10 bills. They are legal tender except for the payment of principal and interest of the public debt.

National Bank Notes.

These also date back to the Civil War. The National Banking System, established in 1863, had as its twofold object the marketing of government bonds and the supplying of a safe and uniform national currency to replace the varied and insecure issues of the state banks. Any national bank may issue these notes, the law requiring that such bank deposit with the Secretary of the Treasury government bonds of equal par value, besides which each bank must deposit in the Treasury as a redemption fund an amount of lawful money equal to 5 per cent of its note issue. These notes are redeemable on demand in lawful money both at the bank of issue and at the Treasury. They are neither legal tender nor lawful money, that is, they cannot be counted by banks as part of their reserves; they are receivable for all public dues except duties on imports and may be paid out by the government for all debts and demands except interest on the public debt and for redemption of the national currency.

Federal Reserve Bank Notes.

Very similar to the national bank note is the Federal Reserve bank note created by the passage of the Federal Reserve Act of Dec. 23, 1913. This act contemplated the retirement of the national bank notes and their replacement by similar notes issued by the Federal Reserve banks. The national banks are not forced, but may if they so desire, retire their notes within a period of 20 years dating from Dec. 23, 1913, by filing an application with the Secretary of the Treasury to sell their bonds held by him in trust; which bonds may be bought by the Federal Reserve bank but not by an amount exceeding $25,000,000 in any one year. Even if the national banks should take full advantage of this opportunity, which so far they have not, it would be impossible to retire in the given period much more than a half of the $701,280,442 national bank notes outstanding at the close of the fiscal year 1918. At the same date the total stock of Federal Reserve bank notes amounted to $4,154,618.

Federal Reserve Notes.

In the Federal Reserve note, also brought into being by the Act of 1913, the United States has been placed in possession of an elastic kind of money, which recent experience has proved to be capable of expanding and contracting in response to the changing needs of business. Federal Reserve notes are obligations of the United States; they are issued at the discretion of the Federal Reserve Board to any Federal Reserve bank. They are secured by the deposit with Federal Reserve agents of a like amount of gold or of gold and such discounted or purchased paper as is eligible under the terms of the Federal Reserve Act. Federal Reserve banks must maintain a gold reserve of at least 40 per cent, including the gold redemption fund, which must be deposited with the United States Treasurer, against Federal Reserve notes in actual circulation. They also constitute a first lien on the assets of the issuing bank. They are redeemable in gold or lawful money at any Federal Reserve bank or in gold at the Treasury. They are neither legal tender nor lawful money but are receivable for all taxes, customs, and other public dues.

Gold the Basis of United States Monetary System.

One central fact emerges from a study of the monetary system of the United States, namely, that all forms of money issued are based on a certain weight of gold. This is nowhere more clearly brought out than in the words of the Gold Standard Act of Mar. 14, 1900.

> Be it enacted, etc., that the dollar consisting of twenty-five and eight-tenths grains of gold nine-tenths fine, as established by Sec. 3511 of the Revised Statutes of the United States, shall be the standard unit of value, and all forms of money issued or coined by the United States shall be maintained at a parity of value with this standard and it shall be the duty of the Secretary of the Treasury to maintain such parity.

This parity of value between all kinds of money and the standard of value is secured, first, through the interchangeability of gold coin and gold bullion by means of free coinage, on the one hand, and the melting pot, on the other. Should the value of the coin exceed the value of the bullion on the coin, gold by virtue of free coinage will flow into the mints, decreasing the supply of bullion till its value equals that of the coin. Should the value of the coin be less than that of its bullion content, coin will flow into the bullion market through the melting pot and the value of the bullion will decrease until they are again equal. Thus, by the interchangeability of coin and bullion, gold coins are kept at an equality of value with gold. Further, by making all other forms of money redeemable in gold coin, the former are kept at a parity of value with gold coin and, therefore, with gold.

In the United States, the unit medium of exchange which is universally acceptable in final payment of all debts both public and private is the dollar of 25.8 grains of gold nine-tenths fine. This is the unit to which all things exchanged for money are compared and in terms of which their values are expressed. This weight of gold minted into coins constitutes the real money of the nation; all other forms of money, being based on it, are subsidiary or supplementary to it.

BIMETALLISM

A nation may select two metals to serve as standard money; in fact, up to a hundred years ago, in most countries both silver and gold were standard money. Such countries are said to have a double or joint standard or to be on a bimetallic basis.

Bimetallism means the free coinage of both silver and gold, with both kinds of coin endowed with full legal-tender power.

The monetary unit consists either of a certain weight of silver or a smaller weight of gold so selected that their values coincide. The first coinage law of the United States, passed in 1792, defined the "dollar or units" each to be of the value of a Spanish milled dollar and to contain either 371$\frac{4}{16}$ grains of pure silver or 24.75 grains of pure gold. There were thus two kinds of dollars in the States in 1792, gold and silver; value was measured by both or by either a certain weight of gold or a certain weight of silver, but as each of these was equal or supposed to be equal in value to the other, there was but one standard value, the joint value of the two.

The government in deciding on the two monetary units is said to establish between gold and silver, a "ratio," sometimes referred to as the "mint ratio." By ratio is meant the relation between the unit weights of the two metals. In 1792, Congress established a ratio between silver and gold of fifteen to one. The standard silver dollar of 371 $\frac{4}{16}$ grains was fifteen times the weight of the gold dollar of 24.75 grains; the United States mints coined both metals into dollars at the rate of fifteen ounces of silver to one of gold.

In determining the mint ratio, the government ascertains the relative values of the two metals in the bullion market. If in the bullion market fifteen ounces of silver are equal in value to one ounce of gold, the weights of the two standard units are fixed, so that the silver unit is to the gold unit as fifteen to one. If the mint ratio is ascertained correctly, the two standard coins will be equal in value. Bimetallism means, then, two unit weights of metal so chosen as to be equal in value. The real standard of value is the joint value with which the values of the respective weights of metals coincide.

Theory and Practice.

The theory of bimetallism is that the joint value will fluctuate less than the value of either metal alone. This is based on the assumption that when two metals are freely coined, if the value of one should increase in the bullion market, coins of that metal will be melted down and sold for bullion the price of which will then tend to sink; while, on the other hand, should the bullion price of one metal fall, the increased demand for it as money will tend to raise its value. Any fluctuations in the bullion value of either of the two metals due to changes in demand or supply would be counteracted by changes in the monetary demand for that metal, so that the market ratio would tend to correspond permanently to the mint ratio.

Though this might be possible in the case of universal bimetallism or if the great nations of the world were to go on a bimetallic basis, past experience has demonstrated that the monetary demand of any one nation has been insufficient to counteract changes in value of one or other of the metals due to changes in supply. In practice, the weakness of bimetallism has sprung from the fact that as soon as the market ratio varies from the fixed mint ratio, the equality of value between the two coins ceases; one is worth more as bullion and disappears from circulation.

Accordingly, the monetary history of most countries shows that the bimetallic standard means an alternating standard, the metal which is undervalued going out of circulation, while the overvalued metal stays and becomes, for the time, the standard of value.

Gresham's Law and Bimetallism.

This tendency is often spoken of as "Gresham's law" the usual statement of which is that poor or bad money drives out good. When coins are worth more as bullion than as money, they will either be melted for use in the arts or exported. When two metals are in circulation together, that which is worth more as bullion than as money is said to be "undervalued," while that which is worth more as money than as bullion is spoken of as "overvalued." People will seek to pay their debts

with the poorer money and hoard, export, or sell as bullion the other. Not only so, but, also, the metal undervalued as money will not be brought by miners to the mint but will seek the bullion market when its value is greater. This is what happened in the United States after 1792; either the ratio of fifteen to one undervalued gold or the market ratio of the two metals changed after 1792, for one ounce of gold in the bullion market was worth 15½ ounces of silver; the mint ratio, in effect, made one ounce of gold equivalent to but fifteen ounces of silver, with the result that no gold was brought to the mints while that in circulation disappeared. After 1834, Congress changed the ratio to sixteen to one, which undervalued silver as much as the previous ratio had gold; silver now disappeared, and gold became the standard money in use. The history of other countries bears similar testimony to the alternating nature of the bimetallic standard.

Summary.

The two chief functions of money are to serve as a medium of exchange and a standard of value. A commod.ty to serve efficiently as money should be generally acceptable, stable in value, portable, readily recognizable, easily divisible, homogeneous, and durable. Though in the course of history many commodities have been used for money, gold has finally been chosen by the great nations of the world to be their standard of value. So vital to the welfare of the nation is a safe and efficient monetary system that in all modern nations the government chooses, regulates, and controls by law the money and the monetary system.

In selecting a commodity to serve as its medium of exchange and standard of value, a country is said to "adopt a standard." The standard of value of the United States is the dollar, consisting of 25.8 grains of gold nine-tenths fine. Coinage is simply a legal device for dividing the standard money metal into convenient units of suitable weight and fineness. The gold coins of the United States are multiples of the dollar, a $10 gold piece containing 258 grains of standard gold. Under its system of free coinage, the United States stands ready to mint all gold into coins at this ratio. These gold coins are known as "stand-

ard money" and form the basis of our monetary system. All other kinds of money issued depend for their value on gold and serve to supplement and conserve gold and so may be termed "supplementary" or "auxiliary money." The three classes of supplementary money are (1) bullion certificates; (2) government and bank notes; (3) token money.

Bimetallism means the free coinage of both silver and gold, with both kinds of money full legal tender. The monetary unit consists of a certain weight of silver or a smaller weight of gold, so selected that their values coincide. Experience shows that the equality of value is apt to be upset by changes in the market ratio. According to Gresham's law, the undervalued money goes out of circulation and the overvalued metal stays and becomes, for the time, the standard of value.

Test Questions

1. What are the two primary functions of money?
2. Mention the chief qualities of a good money.
3. What is the relationship of a government to money?
4. What is meant by the phrase "adopting a standard"?
5. What is "standard" money?
6. What is "supplementary" money?
7. Name the ten kinds of money in the monetary system of the United States.
8. How are the various kinds of supplementary money in the United States kept at a parity with gold?
9. What is bimetallism?

References

BAGEHOT, W., "Lombard Street."
CARVER, T. N., "Principles of Political Economy," Chap. XXIV.
CONANT, C. A., "The Principles of Money and Banking."
CLAY, H., "Economics for the General Reader," Chap. IX.
JEVONS, W. S., "Money," Chaps. I–XVI, XXV, XXVI.
JOHNSON, J. F., "Money and Currency."
JONES, E. D., "Economic Crises."
KEMMERER, E. W., "Money and Credit Instruments in Their Relation to General Prices."
KINLEY, D., "Money."
LAUGHLIN, J. L., "The Principles of Money."
MARSHALL and LYON, "Our Economic Organization," Chaps. XVIII–XX.

MILL, J. S., "Principles of Political Economy," Book III, Chaps. VII-X.
PALGRAVE'S "Dictionary of Political Economy," Vol. 2, p. 787.
RICARDO, D., "Principles of Political Economy and Taxation," Chaps. XXVII, XXVIII.
RIDGEWAY, W., "The Origin of Metallic Currency."
SAY, J. B., "Political Economy," Chap. XXI.
SELIGMAN, E. R. A., "Principles of Economics," Chaps. XVIII, XXIX.
SMITH, A., "Wealth of Nations," Book I, Chap. IV.
SUMMERS, W. G., "History of American Currency."
WHITE, H., "Money and Banking."

CHAPTER XXI

DEPOSIT CURRENCY AND THE BANKING SYSTEM OF THE UNITED STATES

Thus far, we have discussed standard money and those other media of exchange of general acceptability, based upon and supplementing it, commonly termed "money." But there remains another medium, based upon money and supplementing it in its work of effecting exchanges to a greater extent than all the previously mentioned forms put together—namely, deposit credits circulating in the form of checks.

Why Not Classed with Money.

Though closely allied to the supplementary forms of money treated in the last chapter and often preferred to them as a means of payments, as they are preferred to gold, it is not usually classed as a form of money, for the reason that it lacks the general acceptability enjoyed by these other media. All these differ from the check in that they circulate freely from hand to hand without question, while the check, though just as acceptable to certain people and even preferable, is not so to everyone but is limited by personal or local conditions, so that its range of acceptability is narrowed. There are other differences, of course, but this, based on the fundamental requirements of a good money, accounts for the fact that economists do not classify circulating deposit credits as money but deposit currency. "Currency" is a wider term, including all forms of circulating media of exchange.

What Deposit Currency Really Is.

Though differing from the other forms of currency in respect to general acceptability, deposit currency is, in many respects, similar to them. It is issued in terms of standard money and

serves to supplement it as a medium of exchange; it is based on gold ultimately, so that its value, like that of the United States note, depends upon its convertibility into standard money. It is true that it is a step further removed from its base than the United States note, which is directly convertible, whereas a deposit is payable in legal-tender money, which, in turn, is exchangeable for the standard.

Like the United States note, it is not money but a promise to pay money. Both the United States note and the deposits are forms of credit, the one of the government, the other of the bank. There is a still greater similarity between the bank note and the deposit; both are, in effect, the bank's promises to pay money on demand, the chief difference being that the bank note passes directly from hand to hand, while the deposit circulates by means of the check.

Deposit currency is, in reality, a form of circulating bank credit. "Credit" may be defined either as a promise to pay money or a right to the use of money. The record of this promise or right is termed a "credit instrument," such as a United States note or a promissory note which the business man signs when he borrows money from the bank. Both of these are written evidences of promises to pay money, both also constitute rights to money, claims on the promisers to pay money. These credit instruments may, as we have seen, be used to effect exchanges in place of actual money, being as acceptable as the money to which they constitute a claim. They vary greatly in the degree to which they possess the quality of acceptability. The personal note of an individual possesses a very narrow range of acceptability and it is unfitted to become a medium of exchange, but that of a well-known bank has a wider range, and that of the United States government is so generally acceptable that its promises to pay are as good as money in any part of the country. A modern bank deposit is, in effect, the bank's promise to pay money on demand—a promise evidenced on the pass book of the bank's creditor. This deposit credit constitutes a claim on the bank for money which the depositor is able to transfer to others by means of a written order. The check is the instrument by which the depositor's claim on the bank is transferred to others; it is a means for the transfer of bank credit from one

to another. It is so generally acceptable as to be used as a medium of exchange. Deposit currency is, thus, a form of bank credit circulating by means of an order called a "check."

Ways in which Deposit Credit Arises.

Deposit currency issues from the loans of the banks and its use as a medium of exchange is made possible by the mechanism of the banking system. The banking system of the country may be said to serve two purposes—first, it provides a means for the collection of savings and their investment; second, it furnishes an elastic currency for the use of the business community. The first of these functions is performed largely by the savings banks and private banks; the second, by the commercial banks, which include national and state banks and trust companies. It is the latter group that gives rise to deposit currency, to understand the nature of which we need to see how demand deposits come into being in these institutions.

A deposit credit may arise either through an actual deposit of cash or as the result of a loan by the bank to the depositor. Originally, the deposit involved, as the word suggests, an actual deposit of money; and the practice is still common, the personal accounts of salaried and professional men being of this class. But the great bulk of modern demand deposits come into existence as the outcome of loans made by the banks to business men. In the typical loan transaction, the borrower signs a note promising to pay, we will say, $500 in 60 days from date. In exchange for the note, the banker gives the borrower a deposit credit equal to the face value of the note minus interest at the current rate for the period of the loan. Whether the deposit credit springs from an actual deposit of cash or is the outcome of a loan, it exists in both cases as a credit on the books of the bank, a claim against the bank to pay money on demand.

How the Banks Are Able to Create Credit.

In opening up deposit accounts against which no actual deposit of cash has been made, the banks are sometimes said to create credit. We shall see how the banks are able, with a few strokes of the pen, to create a currency that is preferred by the business community to money itself as a medium of exchange.

Now, the commercial bank is a business institution the chief function of which is to loan money and credit at a profit, but the great bulk of its loans today are made in the form of credit. The loaning of credit by banks has been practiced from time immemorial, but the mechanism of the modern banking system has tremendously extended the banks' capacity to create this profitable and serviceable substitute for money. The ancient banker who received money on deposit was usually in business for himself, and as all the money deposited with him would not be demanded at any one time, he soon developed the practice of using part of the funds in his own affairs and loaning part out to others at interest, and it is likely that at first he loaned out actual cash. It is evident that such a banker or money lender, if tied down to make loans in cash, would be limited in the amount of his loans by his total cash assets minus a reserve sufficient to pay the current demands of his depositors. Now, it is easy to surmise how the more profitable practice of creating and lending credit arose. The ancient merchant who had deposited moneys with the banker for safe-keeping would, for convenience' sake when making a payment, give his creditor his deposit receipt or an order on the banker for the money; such an order is the prototype of the modern check. The creditor instead of drawing out the cash would often prefer to leave it in the custody of the bank, receiving a deposit receipt in return, and make his payments in the same way. As this custom developed, and it did at a very early date, borrowers of money would also come to prefer, instead of actual cash, a deposit credit against which at their leisure they would draw orders that could be used in the payment of their debts. Instead of handing his borrower cash, the banker now gave him a claim to cash payable on demand. He lent now not cash but his credit, and as but a small part of these claims to money would normally be demanded at any one time, he was able to create a larger volume of claims than he possessed money. His loaning power was much increased. With the establishment of the custom of payment by check in the business world added to the clearing-house mechanism of the modern banking system for the offsetting of checks, the cash demands on modern banks are remark-

ably small, being, in normal times, less than 5 per cent of their deposits. Thus, a bank's ability to create credit which can be loaned out at interest to business men, and which furnishes them with purchasing power, is tremendously increased.

To get a bird's-eye view of the *modus operandi* of this ingenious system, let us return to our borrower who has exchanged his note for a deposit credit at the bank. He will be likely, at first, to draw heavily against his balance, but as in the ordinary course of his affairs payments are made to him and deposited, he will increase his account in anticipation of the maturity of the note and when it is due he will most likely pay by check, thus closing the transaction. The average bank will have hundreds of borrowers and depositors carrying on these transactions in an endless series; while some are borrowing and drawing heavily on their accounts, others are depositing and preparing for the payment of their notes. The claims that are continuously being presented against the bank by its clients are thus largely canceled by the continuously maturing claims of the bank on them.

Not only so, but, also, the check which the depositor draws will, in most instances, never be paid in cash. The creditor to whom our depositor makes out his check will ordinarly deposit it is his bank. In the possession of this second bank it constitutes a claim on the first. In like manner, another check drawn by a depositor of the second bank and deposited by his creditor into the first would constitute a claim on the second bank. At the "clearing house," these two banks would offset these two claims against each other, thus obviating the payment of any cash. The banking system is, thus, a mechanism within which these claims on the different banks are transformed into deposits in others and settled, for the most part, by cancellation. The net result is that the banks are able to create and maintain a large volume of deposit credit with but a relatively small use of cash.

How Bank Credit Serves as a Medium of Exchange.

We have seen how the banks are able to create deposit credit through the agency of the check and the mechanism of the bank-

ing system; we will now, by a closer examination of that same mechanism, notice how deposit credit is substituted for money as a medium of exchange.

The deposit credit is a claim on the bank for the payment of cash on demand, a claim that may be transferred to another by means of an order termed a "check." If, however, that other cashes his claim, taking the check to the banker for payment, it is evident that the deposit credit has merely postponed the payment of money and not dispensed with it. If Smith, a retail grocer, gives his wholesaler a check in payment for a consignment of sugar, and the wholesaler cashes the check at Smith's bank, no economy of money has been achieved. But, as we have stated, the check, in the majority of cases, will be deposited in the payee's bank and settled by offset without the use of money, in which event, the exchange of commodities will be effected by the check's acting as the medium of exchange in place of money.

In order to see how deposit credit circulating through checks is able to achieve this remarkable economy of money, we will take the simplest case, first, of a buyer and seller having accounts in the same bank. Smith buys a barrel of apples from Brown, paying with a check which Brown deposits in the bank. This transaction involves a transfer of credit from Smith's account to Brown's through the instrumentality of the check, the bank debiting Smith's account and crediting Brown's with the amount of the check. The sale has been made and Brown paid without the passage of a penny—a truly phantom transaction, made with ghost money, yet commercially sound and legally satisfactory. Were there in a community but one bank with which all citizens had accounts, no money would be required at all; purchases and sales could be made by checks and the different accounts debited or credited accordingly.

Were there two banks in the community, Smith belonging to one and Brown to the other, Smith's check when deposited would constitute a claim in possession of Brown's bank on Smith's. Brown's bank would take Smith's check with other claims on the latter's bank and offset them against claims on it in the possession of Smith's bank, only the difference being paid in cash and not even that if a running balance were kept between the two

banks. Smith's check on being returned to his bank would be canceled and his account debited, Brown's account would be credited and the exchange would be effected as before without the payment of money.

This process of offsetting claims is extended indefinitely in our modern banking system through the clearing house. In a community without a clearing house, each bank would be obliged to send a messenger to those banks against which it had checks and collect or offset them. In a clearing house, these messengers all meet at an appointed time, each presenting all the checks which it holds on other banks and, in turn, receiving all those which the other banks hold on it. A balance is then struck between the total claims of each bank on all the others and the total claims of all the others on each individual. The balance is then received or paid by each bank to the Clearing House Association, in cash or by check, probably by a check on the Federal Reserve bank of the district. In London, the clearing house meets twice daily; the annual clearings run to over £20,000,000,000; the balances, which are less than 5 per cent of the total clearings, are paid by checks on the Bank of England, so that literally billions of payments are made without the use of a single sovereign. The total clearings of all the clearing houses of the United States for a single week exceed $9,000,000,000. The total clearings of the New York Clearing House for 1920 amounted to more than $252,000,000,000, the balances being 9.99 per cent of the total. During the last sixty-five years in the New York Clearing House, the balances have averaged but 5.19 per cent of the clearings.

By means of the interconnections between banks, the deposit credit is used to make payments to distant places. Banks have their correspondents in other cities with whom they maintain deposits and through whom they collect payments of checks drawn on those cities and on whom they draw drafts for their clients who wish to make out-of-town payments. The system has been much facilitated by the passage of the Federal Reserve Act under which the Federal Reserve banks are authorizd to collect checks and drafts on member banks and on each other at par.

This remarkable mechanism of the banking system for the off-

setting of claims one against another enables deposit credit circulating through checks and drafts to effect millions of payments with but a minimum use of cash, thus furnishing the community with a cheap and convenient substitute for money as a medium of exchange. The report of the comptroller of the currency for 1926 gives the amount of deposit credit subject to checks on June 30 as $18,208,622,000.

How Deposit Currency Is Secured; the Cash Reserve.

It might be well to note that the word "substitute" is here used in a limited sense, meaning not that deposit currency is able to displace money but to represent it, acting for it as a hand-to-hand medium of exchange. All credit instruments are claims to money; a United States note is a claim on the government for gold, a bank note or a check is, in effect, a claim on a bank for money; these claims to money are acceptable as media of exchange only so long as there is no doubt but that the money to which they lay claim will be forthcoming as required. Under ordinary conditions, such is the confidence of the public in the government and the banks that the credit instruments of either readily pass from hand to hand in lieu of the money to which they are entitled; in consequence, their ultimate dependence on standard money is apt to be overlooked, and some oversanguine souls are even lured into the belief that credit is a thing apart from money, fully capable of existing without it and able completely to supplant it. One might as well believe that a house can exist without a foundation. This truth was demonstrated during the World War by the sunken condition of European currencies due to the weakening of the gold reserves on which they rested.

It should never be lost sight of that all forms of credit currency are promises to pay money and circulate only in place of money at par, because of the fact that the public has confidence that the money promised will be paid if demanded. A credit instrument occupies a rather paradoxical position. If the holder is satisfied that he can obtain the money, he does not want it, but let him once doubt and he at once wants the money. This is particularly true of deposit credit. Let a rumor get abroad that a certain bank is shaky, and its depositors will

descend on it in a swarm, demanding cash. Credit is based on confidence, but that confidence is based, in turn, on ability to pay money, and this ability must be assured. In the case of credit currency payable on demand, this assurance can be secured only by a cash reserve. We have seen how the supplementary forms of money issued by the government and the banks are secured by cash reserves, which assure their ready convertibility into standard money on demand. We will now notice how the convertibility of deposit currency into money is secured by bank reserves.

In a general way, of course, the deposit liabilities of a bank are secured by its assets, but as these deposits are subject to payment in legal-tender money on demand, it is essential that part of its assets should consist of cash. As a bank makes its profit by loaning money and credit, it naturally does not desire to keep any more cash in its vaults than is conservatively necessary to insure the prompt payments of its depositors' demands, which, as we have seen, are small in normal times in comparison to its deposits. To keep any more idle cash than is conservatively necessary is wasteful, entailing loss to the banker and to the business man needing capital. On the other hand, there lies the danger, owing to the fact that the more loans the banker makes the larger his profits, that he will be tempted to extend his loans beyond the point of safety; be unable to meet an unusual demand for cash and become involved in ruin. No bank, no matter how strong, could stand a run on it, could pay all its deposits in cash if demanded at any one time. This does not mean that banks are insolvent but that the banks' assets are not all cash or convertible into cash at a moment's notice. A large part of their assets will consist of the notes of business men, payable within thirty to ninety days. These are sound assets convertible into cash but not immediately. The question resolves itself into the proportion of cash assets which a bank should hold against demand liabilities.

In Europe, generally, the proportion of cash reserves to deposit liabilities is left to the judgment of the bankers. The advantages of this system over that of a legal minimum are that it is, in the first place, more economical in that it allows the banks to adjust their reserves to the temper of the times, reduc-

ing the amount of idle cash in periods of confidence, increasing them only as occasion warrants; second, that it is safer in that it throws the full responsibility for maintaining an adequate reserve on the banker, who, thus charged, is constantly on the alert to strengthen his reserves in *anticipation* of an approaching storm, instead of relying on a rigid legal minimum, which, though it may be in excess of requirements in ordinary times, is insufficient in times of panic. In England, owing to the fact that the reserves are concentrated at one point, all the banks keeping the greater part of their cash reserves in the form of deposits with the Bank of England, the proportion of reserves to depositors is smaller than in any other country—usually, less than 5 per cent.

In the United States, it is customary to determine by law the minimum proportion of cash reserves to demand deposits. The purpose is to protect the public against an unsafe extension of loans on an insufficient reserve by compelling the banks to cease loaning when their cash reserve falls below the prescribed legal requirements. This acts as a check on careless or rash banking practice.

Reinforcement of Cash Reserves by Liquid Assets.

Not only does sound banking demand an adequate cash reserve, but also it is just as essential for a bank to keep its assets in a liquid state, by which is meant that they should be in such a form as to be readily convertible into cash. The assets of a national bank, aside from cash, are "loans and discounts," United States bonds and other securities, and bank property. Chief of these is the item loans and discounts, which consist of promissory notes, trade acceptances, and other evidences of claims against borrowers that the banker has in his portfolio. It is by regulating the character of these loans and discounts that the banker is able to keep his assets liquid. From this point of view, we may divide these loans into two classes—call and time loans.

In the big cities, particularly New York, the banks lend part of their spare funds to brokers. These loans are secured by collateral, stocks or bonds, deposited with the banker as security

and repayable at any time at the call of the banker. This enables the banker to loan out his funds at interest and yet retain control of them. These loans constitute the most liquid of assets, being convertible into cash at a few hours' notice.

The great bulk of the loans made by commercial banks run from 30 to 90 days. The most common form is the promissory note referred to above. A new form in this country, though one which has been for years a favorite in Europe, is the "trade acceptance," which bids fair to increase in popularity here. A trade acceptance is a draft or bill of exchange drawn by the seller on the purchaser of goods, bearing on its face the purchaser's signature as evidence of acceptance, with the date and place of payment. The seller or buyer takes this acceptance to the banker, who in exchange for it gives him a deposit credit equal to its face value, minus the interest charge for the period of the loan. Loans of this character are a favorite with bankers, secured as they are by two names, based on merchandise in transit and tying up the banker's funds for but a short time. Long-term loans, tying up, as they do, their funds for long periods, are not favored by commercial banks. Up to the passage of the Federal Reserve Act, no national bank was allowed to loan money on the security of farm lands. The new act permits a national bank not in a central reserve city to make such loans, not to run longer than 5 years and not to exceed in volume 25 per cent of its capital and surplus or one-third of its time deposits.

How a bank is able to reinforce its cash reserve by keeping the bulk of its loan assets in such a form as to be convertible into cash at short notice will now be clear. Over against its demand liabilities it has its loans in such a form and arranged in such a way as to be coming due daily. The banker is able, moreover, to contract or expand them as his judgment dictates. In periods of confidence when business is good, when a smaller cash reserve is necessary and more loans demanded, he can extend his accommodations. When the storm signals of an approaching panic are flying, he is able to shorten sail by gradually contracting his loans, at the same time increasing his cash reserve. Here, again, the Federal Reserve Act has come to the rescue and given greater

elasticity and mobility to bank credit than ever it had before, by "rediscounting" and the establishment of an open discount market.

The Federal Reserve Banking System.

So vital to the economic prosperity of a nation is its banking system, so important to trade and industry is its smooth functioning, and so disastrous are its effects when it gets out of order and overexpansion of credit occurs that most governments have provided some system of control over its operations. The Federal Reserve Act of 1913 has provided the United States with a sound banking system. This act supplements the National Bank Act of 1864 and corrects its chief defects, which were: a lack of centralized control; an inelastic system of bank credit; a defective exchange and transfer system. The banking system of any great nation is a highly complicated mechanism of interrelated functions and operations. The following explanation seeks to make clear, first, the organization of the Federal Reserve System; second, its chief functions, their operation, and the economic services which they perform for the nation at large.

Organization of Federal Reserve System.

Under the Federal Reserve System, the whole country is divided into twelve districts, denoted by numbers, and in a designated city in each district is located a Federal Reserve bank. The twelve districts and their central reserve cities are: 1, Boston; 2, New York; 3, Philadephia; 4, Cleveland; 5, Richmond; 6, Atlanta; 7, Chicago; 8, St. Louis; 9, Minneapolis; 10, Kansas City; 11, Dallas; 12, San Francisco. Each Federal Reserve bank may establish branches in other cities in its district. The Federal Reserve bank of Cleveland, for example, has a branch at Pittsburgh and another at Cincinnati; altogether there are at present (1928) twenty-five branches.

Each Federal Reserve bank is a corporation the stock of which is owned by the "member" banks of the system within its district. The member banks are the national banks, which under the law must join the system, and those state banks and trust companies which elect to belong to the system under the provisions made for them. On Jan. 31, 1926, there were 9,459

member banks, of which 8,030 were national banks, and 1,429 were state banks.

Each Federal Reserve bank is managed by a board of nine directors, six of whom are selected by the member banks and three by the Federal Reserve Board. The six local directors are divided into two groups, class A and class B. The three directors comprising the class-A group are selected from bankers in the district. The three B-class directors are chosen from business men prominent in the district. This arrangement permits a high degree of local management and places upon the board men who are conversant with both the banking and business conditions of each district. The Federal Reserve Board selects the three class-C directors, one of whom serves as chairman of the board of directors of the bank.

The system as a whole is headed by the Federal Reserve Board, comprising the Secretary of the Treasury, the Comptroller of the Currency, and six other members chosen by the President of the United States. Its office is in Washington. By virtue of the powers conferred upon it, it controls the operation of the whole system.

Functions.

The chief functions of the Federal Reserve banks are (1) note issue; (2) rediscounting of commercial paper; (3) the control of reserves; (4) open-market operations; (5) clearing and collection service; (6) acting as fiscal agents of the United States government.

Note Issue.

The conditions governing the issue of Federal Reserve notes and Federal Reserve bank notes have already been described. The Federal Reserve note constitutes a most important addition to the monetary system of the United States on account of its elasticity, that is, its ability to expand and contract in response to the needs of trade and industry. The national bank note, which the country relied on under the National Banking System to provide it with an elastic currency, lacked elasticity. In fact, it has often been referred to as being "perversely elastic," of increasing or decreasing in inverse ratio to the needs of

business. This was due to the fact that it was often profitable for the banks to decrease their issues of notes when most needed and increase them when they were not so urgently required. Their fluctuations were determined by the prices of the government bonds by which they were secured rather than by the changing demands of business. The provision of the Federal Reserve Act for the issue of Federal Reserve notes, through the rediscounting of commercial paper, has given the country what it has long needed, *viz.*, an elastic kind of currency capable of expanding or contracting as business itself increases or decreases. Experience has proved that they are capable of both expanding and contracting with changes in business conditions. During the business boom of 1919 and 1920, the quantity of Federal Reserve notes issued rose to 3,500,000,000; in the depression of 1921 and 1922, it fell to below 2,500,000,000.

Rediscounting.

Perhaps the most important operation of the Federal Reserve banks is to make loans to the member banks by rediscounting their commercial paper. The Federal Reserve banks do not loan directly to individual firms or corporations. These ultimate borrowers secure loans from the member banks, which, in turn, are enabled to borrow from the Federal Reserve bank of their district by rediscounting the paper of their customers. A concrete illustration will make this process clear. Suppose, for example, that the United States Shoe Company of Cincinnati wishes to borrow for current manufacturing purposes $20,000. It secures a loan of $20,000 for 90 days at 6 per cent from the Second National Bank of Cincinnati, giving its promissory note as evidence. The bank indorses the note and sends it to the Federal Reserve Bank at Cleveland, which rediscounts it at 4 per cent and places the proceeds to the reserve deposit account of the Cincinnati bank. In the meantime, the original borrower manufactures and sells the goods, and the note falls due. Shortly before the note matures, the Cleveland Reserve Bank sends the note to the Second National Bank of Cincinnati, where it is paid by the borrowers. The Second National then pays the Federal Reserve Bank, and the transaction is closed.

The proceeds of such loans made by Federal Reserve banks

to member banks may be either in the form of a deposit credit or in Federal Reserve notes, according as the member bank wishes cash or a reserve deposit which it may use to enlarge its own loans and deposits. The character of the paper which may be rediscounted by the member banks is limited by the act to commercial paper drawn for agricultural, commercial, or industrial purposes; loans for speculative purposes are not eligible for rediscount. Agricultural loans must have a maturity not exceeding 9 months. In the case of other paper, the maturity must not exceed 3 months. In addition to loans based on commercial paper, the Federal Reserve banks may loan to member banks on collateral of United States government bonds.

Organization of Banking Reserves.

The Federal Reserve Act of 1913, while it reduced the existing reserve requirements of the individual bank of the national system, rendered them far more mobile and effective by creating a reserve organization with a high degree of centralization of control. Under the Federal Reserve System, each member bank is required to keep with the Reserve Bank of its district a minimum percentage of its deposits as follows: of demand deposits, country banks 7 per cent, reserve city banks 10 per cent, central reserve city banks 13 per cent; of time deposits, all member banks alike must maintain a reserve of 3 per cent. In addition, of course, each member bank at its own discretion must keep a cash reserve in its own vaults to meet current obligations, but this amount is usually very small, being about 3½ per cent of demand deposits and 2 per cent of total deposits. On Sept. 28, 1925, the lawful reserves of the 8,085 national banks in the system amounted to approximately 13 per cent of their demand deposits and 6 per cent of their total deposits. These reserves of the member bank become the deposits of the Federal Reserve banks, against which each must keep a reserve of 35 per cent in gold or lawful money. Actually, in the past, the Federal Reserve banks have maintained reserves much in excess of this amount.

Under the old national banking system, the reserves of the banks throughout the country gravitated to the three central reserve cities, particularly New York. This local concentration

of reserves lacked the one thing needful, namely, centralization of control. The reserves were scattered among the big banks in the central reserve cities, each of which, concerned chiefly with its own affairs, loaned these funds out on call to brokers, no one being responsible for their availability in anticipation of a demand for cash from the country at large. As a result, when a panic arose, the New York banks, themselves caught short of cash, called their loans and suspended payments. The banks throughout the country, unable to get their reserves deposited with the New York banks, likewise contracted their loans, and disaster followed. In short, under the old system, the reserves were scattered in separate banks, with the result that, in time of danger, no concerted plan of action was possible. Under the present Federal Reserve System, the banking reserves are marshalled in the twelve Federal Reserve banks, each of which serves as a reservoir for its district, while provision for concerted action is secured through the agency of the Federal Reserve Board by virtue of the power to compel any one Reserve Bank to rediscount the paper of any other. If, for example, conditions are such in the Kansas district that the banks there require extra funds, the Board may compel the Cleveland Reserve Bank to rediscount some of the paper of the Kansas City Reserve Bank, thus enabling the latter to expand its credit to meet the needs of its district. This control exerted by the Federal Reserve Board, in effect, connects up the twelve district reservoirs of reserves in one system, placing the funds of all the Reserve banks at the disposal of any one. Just as the big power and light companies throughout the country, by linking up their lines under a unified control so that power can be transferred from one part of the system where it is plentiful to another where there is a shortage, are able to equalize loads and relieve a shortage in any part of their system, so the Federal Reserve Board is able to adjust credit conditions throughout the country and relieve a strain in any section, by means of its centralized control over the banking reserves of the nation.

Perhaps the most striking innovation of the new system is the manner in which the member banks are enabled to build up their reserves by rediscounting their commercial paper. This privilege becomes particularly important in case of an emergency.

Heretofore, when a bank was in trouble and needed immediate funds, its own assets in the form of commercial paper were unavailable. These it can now take to its Federal Reserve Bank and convert into cash in the form of Federal Reserve notes or into a deposit credit against which it can extend its own credit. This power conferred on the member banks under the new act, of securing cash or a deposit credit with their Federal Reserve banks by rediscounting the notes in their own portfolios, has practically removed from all sound and solvent member banks the fear of failure through a "run"—as well as increased the banks' power to extend accommodation to their customers in time of need.

Elasticity of Bank Credit.

Not only has the Federal Reserve System in the manner just described safeguarded the banking reserves, but also in addition, it has given the nation what it has long needed, namely, an elastic bank credit, capable of expanding and contracting with the needs of business. This has been achieved under the Federal Reserve System as a result of the rediscounting process and the manner by means of which the reserves are organized and controlled. As the amount of loans the member banks are able to make is limited by the amount of their reserves, a more effective organization of their reserves has increased their power to loan. The reserves of the member banks, it will be recalled, are the deposits of the Federal Reserve banks. The deposits of the Reserve banks may be increased provided the banks maintain a 35 per cent reserve of gold or lawful money. This arrangement gives the loaning power of the member banks a high degree of elasticity, based, as it is, on a small amount of gold or lawful money, kept in the vaults of the Federal Reserve banks. The comparatively small amount of reserves concentrated in the Federal Reserve System permits a cumulative expansion or contraction of the loaning power of the member banks. The extent to which bank credit can be expanded under the Federal Reserve System is illustrated by the following figures: by June 30, 1920, the 9,399 member banks of the system had deposits of approximately $24,300,000,000. Against these deposits they held, with the Federal Reserve banks, reserves of $1,800,000,000;

against the reserve of $1,800,000,000, the Federal Reserve banks held a reserve of 35 per cent or $650,000,000. This comparatively small reserve could support a bank credit thirty times its size.[1]

It will be evident, moreover, that the rediscounting privilege has given bank-deposit credit the power to contract and expand with changes in business conditions. When business is increasing in volume, that very increase makes possible an increase in bank-deposit credit, by means of which it may be financed. When business is active and business men are going to the banks and discounting their notes, the amount of commercial paper in the possession of the banks eligible for rediscount is increased. When business decreases, and notes are being paid off, it decreases. An increase in business thus automatically provides for an extension of the credit necessary to finance the extra volume. This is due to the fact that the basis of credit under the new Federal Reserve System is wealth in the process of production. The notes of business men are based on the wealth being produced, and their volume expands and contracts with the production of wealth. This power of the banks to expand and contract their loans and discounts to meet changes in the demands of business is vitally important in the light of the fact, previously shown, that the large bulk of commercial transactions are carried out by means of deposit credit circulating in the form of checks.

Finally, the power of the Federal Reserve Board to review and alter the rediscount rates of each of the separate Federal Reserve banks enables it to control the discount rates of the various Federal Reserve districts and so bring about an expansion or contraction of bank credit in any one district or in the system as a whole. If, for example, there is a speculative boom in the New York district, which may have a low rediscount rate, enabling the New York banks to rediscount eligible paper at a low rate and loan to large borrowers at correspondingly low rates, the Federal Reserve Board, by compelling the New York Federal Reserve Bank to increase its discount rate, is enabled to raise the discount rates of the member banks and thus contract loans and discounts. Or in a period of depression, or

[1] KILBORNE, "Money and Banking," p. 414.

impending depression, the Board by lowering the rediscount rates of the Federal Reserve banks may encourage business activity by permitting lower discount rates over the whole country.

As a result of the foregoing functions—the elasticity of note issue, the rediscounting of commercial paper, the effective organization of reserves, and the centralized control over banking operations by the Federal Reserve Board—we have in the United States today a sound and elastic system of bank credit.

Open-market Operations.

Besides their dealings with member banks, the Federal Reserve banks are permitted to buy and sell certain kinds of commercial paper in the open money market. These operations are called "open-market operations." In these operations, a Federal Reserve Bank is not confined to dealing with the member banks in its district but buys and sells to member and nonmember banks. Two classes of paper are dealt in. The first consists of government obligations such as bonds, warrants, and notes of other governmental divisions of the United States. The second class consists of bills of exchange and bankers' acceptances. This power was conferred for two reasons: first, to enable the reserve banks to utilize profitably their surplus funds and, second, to enable them to control the discount rate. If at any time the rediscounting operations of the reserve bank for their members do not engage all their funds, the surplus may be profitably employed in the buying and selling of commercial paper and securities. Their ability thus to buy directly in the open market also adds to their power to control the discount rate. If the market rate is below the bank rate, the Reserve banks by selling paper in the open market can contract bank credit, as the funds of the banks purchasing the paper will be reduced; if the market rate is above the bank rate, the Reserve banks purchase paper, thus releasing the funds in commercial banks and bringing the market rate in line with the bank rate. The Federal Reserve banks are also allowed to purchase gold coin and bullion and cable transfers which enable them to exercise some control over the foreign-exchange market and protect dollar exchange.

We have already described the function of note issue. This provides the nation with an elastic currency, which expands and contracts with the needs of industry.

Clearing and Collection Operations and the Gold-settlement Fund.

The Federal Reserve System serves as a clearing house for the banks of the entire nation. The Federal Reserve banks and their branches clear checks, drafts, and other claims not only for the member but also for non-member banks. They secure collection of checks and drafts at par with a minimum of expense and in the shortest possible time. This service of clearing and collection is a vast improvement over the old expensive and complicated system in use before the Federal Reserve Act was passed. The non-member banks by keeping a balance with the Federal Reserve banks are able to receive the benefits of par collection and clearing. In June, 1926, there were 9,384 member banks and 15,257 non-member clearing banks in the system. Clearing-house transactions in the twelve Federal Reserve cities in the year ended Sept. 30, 1926, aggregated $426,914,203,000.

The gold-settlement fund is the foundation of the collection and clearing system. This fund, held by the Treasurer of the United States in the name of the Federal Reserve Board, is the property of the twelve Federal Reserve banks, each of which must keep at least $1,000,000 in it, though, as a matter of fact, a much larger amount is maintained. On Dec. 8, 1926, the total fund amounted to $731,000,000. Settlements through the gold fund are made daily by wire. Each of the Federal Reserve banks wires its credits to the others. The totals of credits and debits are made, and those banks having net credits have their gold account increased. On Thursday, Aug. 26, 1926, the total transactions amounted to $350,000,000, while the net change in the ownership of gold was but $14,000,000, about 4 per cent of the total clearings. In 1919, approximately $74,000,000,000 was cleared through the gold-settlement fund at a cost of $250,000. If the Federal Reserve bank had made a charge of 10 cents per $100 and if members and clearing members charged their customers the same rate, the total cost would have been $74,-000,000. The intradistrict clearing in that year amounted to

$135,000,000.[1] A tremendous saving is effected for business as a result of the clearing and collection service of the Federal Reserve System.

Fiscal Operations for U. S. Government.

Differing from most other great nations, the United States government has in the past conducted its own financial business —through the Treasury and subtreasuries, the offices of the mints, and a number of national bank depositories. The Federal Reserve Act provided that the funds of the United States might be deposited with the Federal Reserve banks, which banks might be required to act as fiscal agents of the government. By an act passed in 1920 authorizing the discontinuance of the subtreasuries, these have been abolished, the last closing its doors on Feb. 10, 1921. The Federal Reserve banks now act as depositories for the funds of the government. They pay out these funds on check; they pay interest on bonds when the coupons are presented for payment. They transfer funds from one part of the country to another. They redeem the various forms of money for the government and cancel money unfit for circulation. The government still keeps a large part of its funds on deposit with certain selected banks.

Summary.

Deposit credit circulating by means of checks constitutes one of the most important media of exchange of modern commerce. A deposit may arise either through an actual deposit of cash or in the process of a loan by the bank to a depositor. In either case, it constitutes a claim on the bank and is equivalent to the bank's promise to pay on demand. This claim when transferred to another by means of a written order called a "check" is used in payment for goods. Though a check calls for the payment of money, the offsetting of checks through the mechanism of the clearing house results in few checks' being actually presented for payment in cash. This enables deposit credit circulating in the form of checks to effect the exchange of millions of dollars' worth of goods with the use of a minimum of money. It is im-

[1] Seventh Annual *Report* of Federal Reserve Board, 1920.

portant to notice that though deposit credit economizes the use of money, it is not a substitute for money. It is a form of credit currency the acceptability of which depends on its convertibility into money on demand. This convertibility is assured by the reserves which banks maintain against their deposits.

Bank credit plays such a vital part in business, and industrial and commercial prosperity is so dependent on a safe and sound banking system that the governments of most countries exercise some control over banking operations. In the Federal Reserve System established under the act of 1913, the United States possesses a highly efficient banking system. The whole country is divided into twelve districts, and in a designated city in each district is located a Federal Reserve bank the stock of which is owned by the "member" banks within its district. The "member" banks are the national banks, which, under the law, are forced to join the system, and the state banks and trust companies, which elect to belong under the provisions made for them. Each Federal Reserve bank is managed by a board of nine directors. The system as a whole is governed by the Federal Reserve Board, consisting of the Secretary of the Treasury, the Comptroller of the Currency, and six other members chosen by the President.

The chief functions performed by the Federal Reserve System are: (1) Through the issue of Federal Reserve notes, it has provided the country with an elastic kind of currency. (2) It has enabled the member banks of the system to borrow from the Federal Reserve bank of their district by rediscounting the commercial paper of their customers. (3) It has safeguarded the banking reserves of the nation by creating a reserve organization with a high degree of centralization of control. (4) It has given to bank credit a greater degree of elasticity, enabling it to expand and contract with the changing needs of business. (5) Its open-market operations enable the Board to control the discount rate and to exercise some control over the foreign-exchange market. (6) It serves as a clearing house for the banks of the entire nation and in so doing has effected a great saving to the business community in the clearing and collection of checks. (7) It performs valuable services to the government in its capacity of fiscal agent.

Test Questions

1. What is the distinction between deposit currency and the other kinds of currency discussed in the preceding chapter?
2. How does deposit currency originate?
3. How does deposit currency serve as a medium of exchange?
4. Show how checks are offset against one another in the clearing house.
5. How is deposit currency secured?
6. Explain how cash reserves are reinforced by liquid assets.
7. What is "rediscounting"?
8. Describe the functions of the Federal Reserve System.

References

CARVER, T. N., "Principles of Political Economy," Chap. XXV.
CONANT, C. S., "Wall Street and the Country."
CLAY, H., "Economics for the General Reader," Chap. X.
FISKE, A. K., "The Modern Bank."
HEPBURN, A. B., "History of Currency in the United States."
KILBORNE, "Principles of Money and Banking."
JOHNSON, J. F., "Money and Currency."
KEMMERER, E. W., "Modern Currency Reforms; the A B C of the Federal Reserve System."
KEYNES, J. M., "Indian Currency and Finance."
KIRKBRIDGE and STERRETT, "The Modern Trust Company."
LAUGHLIN, J. H., "Banking Progress; Money and Prices."
MOULTON, H. G., "The Financial Organization of Society," 1921.
PRATT, S. S., "The Work of Wall Street."
SCOTT, W. A., "Money and Banking."
SMITH, A., "Wealth of Nations," Book II, Chap. III.
WHITE, H., "Money and Banking," Parts I, II.

CHAPTER XXII

CHANGES IN THE VALUE OF MONEY, OR THE LEVEL OF PRICES AND THEIR MEASUREMENT

Changes in the Value of Money and Price Levels.

We now come to a subject of intense practical importance and one which during the last few years has been of much public interest. We have before referred to the fact that the value of money, the standard of all other values, is itself subject to change and that its fluctuations vary inversely with changes in the level of prices. The term "value" is used here in a general sense, denoting the abstract relationship existing between money and all other commodities. Strictly speaking, money has many values. No one commodity does for money what money does for all others in its capacity of a standard of value. In the economic world, there is one accepted measure of value for each and every commodity, one specific relation which denotes the general relation which each good bears to all others, which gages its standing in the market—namely, its money price. But no one other commodity serves as a measure of the value of money. Money has, of course, as many separate values as there are commodities offered for sale; the other side of every price quotation expresses a value of money. If wheat is quoted at $1 a bushel, the value of a dollar in terms of wheat is one bushel. But if wheat goes up to $1.25 a bushel, though the value of money in terms of wheat has fallen, $1 commanding in exchange only four-fifths of a bushel, it does not necessarily follow that the value of money in relation to all other commodities has fallen. The rise may and is usually taken to indicate an increase in the value of wheat. If, however, the prices of other commodities have gone up, the higher price of wheat may be due to a fall in the value of money. In this case, the value of wheat in reference to other commodities will remain the same,

but the value of money, the purchasing power of a dollar, will have shrunk. If all prices were to rise 25 per cent, it is evident that a dollar would purchase only four-fifths of what it would before; that is, its value would decrease one-fifth or 20 per cent. Changes in the value of money would thus be registered by inverse changes in the general level of prices. But prices never rise and fall alike. They are most chaotic in their changes; some fluctuate violently from day to day, others steadily rise or fall for long periods, and some scarcely vary at all. But though some go up and some go down and others change but little, the *general level* of prices is always tending up or down. The problem is to measure these movements of the general level of prices, a problem which is solved by a device called an "index number," the invention of an Italian by the name of Carli, in 1750.

The Selection of Commodities for an Index Number.

An index number is simply a *summary* in some form of the price changes of a selected set of commodities, used, as the name suggests, to indicate changes in the level of prices in general. It serves somewhat the same purpose as the water gage of a boiler the visible rise or fall of which denotes changes in the invisible level of the water within.

In constructing such an index, the first consideration is to select a set of sample commodities the price changes of which will fairly represent those of commodities as a whole. If all commodities fluctuated alike, changes in the prices of a few selected at random would accurately reflect price changes as a whole. But as all commodities do not fluctuate alike and are not all of the same importance as elements of the general system of prices, the value of an index number as a reliable indicator of changes in the general price level will depend, in the first place, on whether it is based on a carefully chosen representative list of commodities.

Prices of commodities tend to move in groups. And it is the presence of these groups of commodities whose prices advance or fall in harmony that constitutes a source of danger to index numbers. The prices of raw materials tend to move together and may be distinguished as a class from manufactured goods. Again, raw materials may be subdivided into several groups of

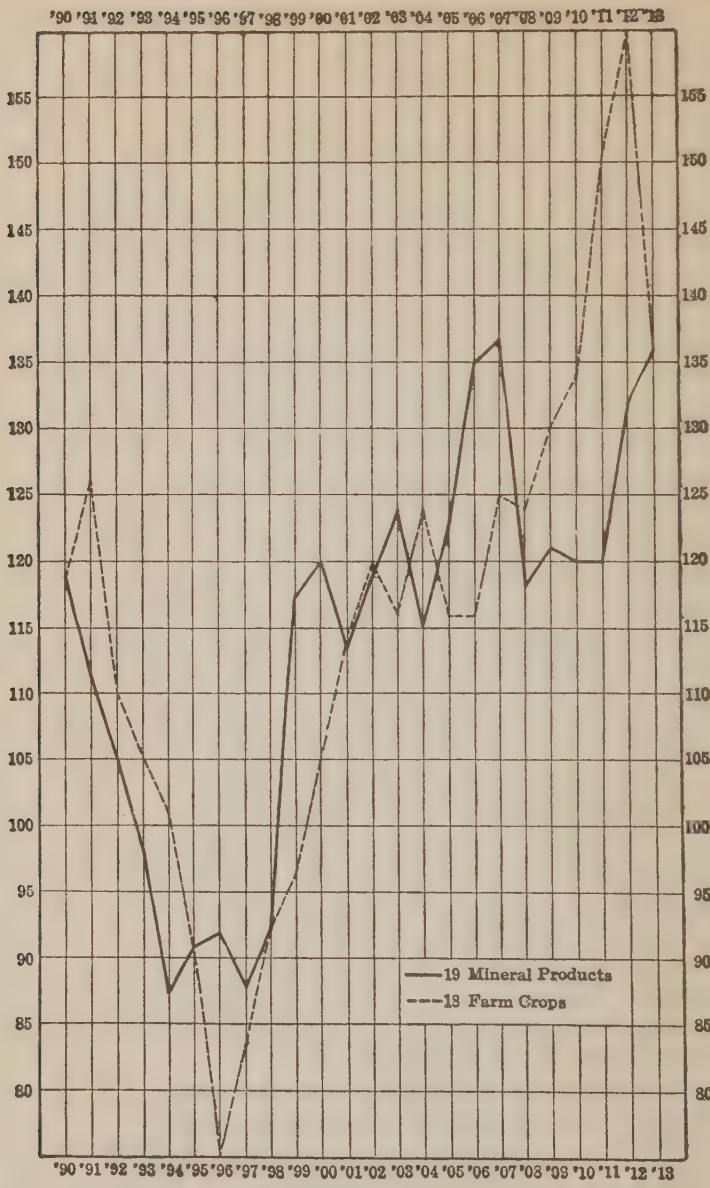


Fig. 13.—Index Numbers of the Prices of 19 Mineral Products and of 18 Farm Crops.

products with closely related prices, such as minerals, forest, animal, and farm products. Manufactured goods may also be divided into two groups which behave quite differently, namely, producers' goods and consumers' goods, the former including all articles bought for business use, the latter those purchased directly by consumers. Some of these groups are interrelated and at times move in unison, as in the case of raw materials and the partly finished or finished products made from them. Others differ widely in the degree in which they fluctuate or move in entirely opposite directions, as the accompanying chart of farm and mineral products shows.

It is very evident then that an index number based on an undue quantity of any one or two of these groups will not represent prices as a whole and might by being confined to a particular clique grossly misrepresent them, a possibility that those who read index numbers published in the United States purporting to gage changes in the general level of prices might do well to bear in mind. Figure 14 (p. 328), of two index numbers, the one based on miscellaneous commodities, the other on food products, bears testimony to this fact.

It will be noticed that the food index flatly contradicts the general commodity index in 1890 to 1892, 1900, 1901, etc. Such contradictions are due chiefly to contrasts in those years between business conditions and harvest conditions. A food index made up, for the most part, of farm products, animal products, and partly finished products produced from them, on account of its susceptibility to seasonal harvest conditions, is very apt to give a wrong impression of prices in general.

Price Data.

Just as important as selection of the commodities that go to make up the index is the securing of accurate price quotations; on these the reliability of the index numbers rests. As a rule, wholesale market prices are chosen. Representative retail prices are difficult to obtain owing to local variations, though several retail indexes are now published here and abroad. The price quotations for a particular date, such as the first of the week or month, may be taken, or an average price may be struck from a number of quotations.

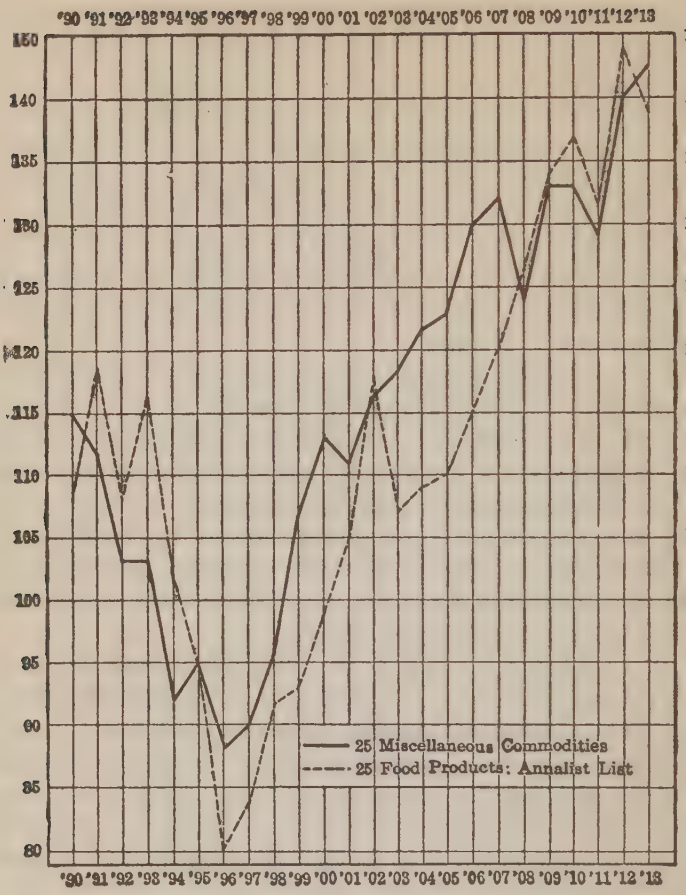


FIG. 14.—Index Numbers of the Prices of 25 Food Products and of 25 Miscellaneous Commodities.

Methods of Computing.

Various methods are employed to manipulate these prices to gage changes in the general price level. A simple illustration of each of the three chief methods will suffice to make clear the nature of index numbers and enable us to read any one with some appreciation of its significance as well as its limitations.

The crudest method of all is to add the actual prices of the selected commodities for each period to be investigated and com-

pare their sums. Let us assume that the prices of wheat, currants, opium, and pig iron for 1900, 1901, and 1902 were as follows:

TABLE VIII.—AGGREGATE PRICES

Commodity	Unit	1900	1901	1902
Wheat	Bushel	0.80	0.85	1.40
Currants	Pound	0.10	0.15	0.13
Opium	Pound	6.00	7.50	6.20
Pig iron	Ton	16.00	17.50	18.00
Aggregate prices	.....	22.90	26.00	25.75

A comparison of the "aggregate prices" shows that the cost of the four commodities rose in 1901 and fell slightly in 1902. This method of gaging changes in the general price level by adding the actual prices of such incongruous units as pounds, bushels, tons, and ounces is subject to great inaccuracies. A relatively small change in a high-priced unit such as opium exerts more influence on the total than a relatively great change in a low-priced but important unit such as wheat. In the above table, for example, the 22 per cent drop in opium exerts almost three times the influence on the aggregate price for 1901 as does the 69 per cent rise in wheat. And even if, as is sometimes done, the various units are all reduced to one quantity such as pounds, this distortion still exists.

To avoid these inaccuracies, the actual prices are turned into relative prices on the basis of 100. By "relative price" is meant the percentage the actual price of a commodity at any period is of its actual price at a given period chosen as a base from which price fluctuations are to be measured. All prices of commodities at this base period will, therefore, be represented by 100, and all changes will be expressed as relatives of 100, a rise of 10 per cent being recorded as 110, a fall of 10 per cent as 90. For example, if we take 1900 as the base year in the table above, to find the relative price of wheat for 1901, we simply divide the actual price 85 cents by the base price 80

cents and multiply the quotient by 100, which gives us 106. The price of wheat in the base year will be represented by 100 and in 1901 by 106, showing a rise of 6 per cent in the price of wheat. The following table gives the relative prices of the four products, using the year 1900 as the base period:

TABLE IX.—RELATIVE PRICES

Commodities	Units	Base 1900	1901	1902
Wheat	Bushel	100	106	175
Currants	Pound	100	150	130
Opium	Pound	100	125	103
Pig iron	Ton	100	109	113
Sums	.....	4)400	4)490	4)521
Index number (arith. average)	.....	100	123	130

By adding these relative prices for each period and dividing by their number, the final index number is found which is thus the simple arithmetical average of the relative prices of the commodities taken. In the above table 100, of course, represents the average of prices in 1900, while the index numbers for 1901 and 1902 show there has been an average rise of 23 and 30 per cent, respectively, in the prices of all the commodities taken.

Other methods of averaging are sometimes employed. The geometric mean used by Jevons gives a more accurate average in that it protects the index number from being unduly influenced by extreme variations in the prices of a few articles; medians are sometimes preferred for the same reason.

In distinction to a "simple" index number based on the single price of each article included such as just described is a "weighted" index number, wherein the price of each commodity is multiplied by some number, to accord it an influence on the result in proportion to its economic importance. There are many methods of "weighting"; to illustrate the principle, we will describe that used by the U. S. Bureau of Labor Statistics in computing the index now currently published in their

monthly bulletin. According to this system, the economic importance of an article is expressed by the value of the total quantity exchanged in a given year. The index is constructed by multiplying the price of each article at each period by the estimated quantity exchanged and adding these weighted prices to obtain the aggregate weighted price or the total value in exchange of all the commodities at each period. The final index number, which tells at a glance the percentage of rise or fall in the price level, is obtained by dividing the weighted total of each period by the base total. The following table illustrates the process. Instead of using the exact figures, the assumed quantities and values of the articles entering into exchange are expressed in round millions.

TABLE X.—WEIGHTED PRICES

Commodity	Base 1900			1901			1902		
	Price	Quantity exchanged used as weight, millions	Weighted price, millions	Price	Quantity exchanged in 1900 weight, millions	Weighted price, millions	Price	Quantity exchanged in 1900 weight, millions	Weighted price, millions
Wheat, bushel....	$0.80	735	$588	$0.85	735	$624	$1.40	735	$1,029
Currants, pound..	0.10	32	3	0.15	32	5	0.13	32	4
Opium, pound....	6.00	1	6	7.50	1	7	6.20	1	6
Pig iron, ton.....	16.00	8	128	17.50	8	140	18.00	8	144
Aggregate weighted prices.....			$725	.....	.....	$776	.....	.....	$1,183
Index numbers (relative prices 1900 base period).....			100	.....	.....	107	.....	.....	163

The object of weighting is to prevent the index number from being unduly influenced by changes in the prices of unimportant commodities and to accord to the great staples a position on the index equivalent to that which they occupy in the system of actual prices. It is obvious that opium and currants do not exert an influence on the general level of prices equal to that of wheat and iron. The simple index number in the year 1901,

under the influence of currants and opium, soars way up, while the following year, tricked by a fall of the same insignificant pair, it fails to do justice to the rise in wheat and iron. The weighted index number corrects these maladjustments, toning down the exaggerated rise in 1901 and, by giving the great staples wheat and iron power in proportion to their economic importance, registers a more significant advance in the price level.

For the sake of making clear the principle, we have somewhat exaggerated the difference in the results obtained from the use of weighted and simple index numbers. When a larger number of commodities are taken, the influence of extreme increases or decreases in the more unimportant commodities are apt to be lessened by one's neutralizing the other: such an index tends to weight itself, though "haphazard" weighting of this character may, and often does, result in a viciously weighted index. Weighting is sometimes attained in a simple index number by causing an important commodity, such as wheat, to be represented indirectly several times by including two kinds of wheat, four of flour, bread, biscuits, etc. While actual tests made by comparing weighted and simple index numbers show a fairly close agreement, both pointing out equally well the general trend of prices, there seems to be a growing opinion among experts, both in this country and abroad, that an index number based on a large number of carefully selected commodities weighted in accordance with their economic importance will reflect changes in the general level of prices with greater accuracy; and such a conclusion seems sound.

Bird's-Eye View of Price Changes in United States from 1840 to 1925.

Through the courtesy of the Bureau of Labor Statistics department, we present the following table of prices covering the years from 1840 to 1925. This index number is an amalgamation of that of the United States Senate Finance Committee, running from 1840 to 1890, with the current index of the Bureau of Labor Statistics, which commences at the year 1890. The Senate Committee's, or "Falkner's," Index, as it is sometimes termed, is a simple index based on the wholesale prices of over 223 articles.

Both indexes have been reduced to a common base, prices in 1913 equaling 100, and are consolidated at the year 1890.

TABLE XI.—INDEX NUMBER OF WHOLESALE PRICES 1840-1925

1913 = 100

1840	103	1862	103	1884	87	1905	85
1841	102	1863	130	1885	82	1906	88
1842	95	1864	167	1886	81	1907	94
1843	89	1865	190	1887	81	1908	91
1844	89	1866	168	1888	83	1909	97
1845	90	1867	151	1889	83	1910	99
1846	93	1868	142	1890	81	1911	95
1847	93	1869	135	1891	81	1912	101
1848	89	1870	125	1892	75	1913	100
1849	87	1871	119	1893	77	1914	100
1850	90	1872	122	1894	69	1915	101
1851	93	1873	121	1895	69	1916	124
1852	90	1874	117	1896	66	1917	176
1853	96	1875	112	1897	66	1918	196
1854	99	1876	104	1898	69	1919	212
1855	99	1877	97	1899	74	1920	226
1856	99	1878	89	1900	80	1921	146
1857	99	1879	85	1901	79	1922	148
1858	89	1880	94	1902	85	1923	153
1859	88	1881	93	1903	85	1924	149
1860	88	1882	95	1904	86	1925	158
1861	88	1883	93				

The following chart presents this index number in graphic form and makes clear at a glance the upward and downward swings of prices during the last eighty years. The index number *indicates* that the general level of prices in 1920 was 126 per cent higher than in 1913, which would signify that the value of money in the United States had depreciated 56 per cent, a dollar in 1920 being equivalent in purchasing power to 44 cents in 1913, as far as wholesale prices are concerned.

The Bureau of Labor Statistics has recently issued a series of index numbers of wholesale prices with 1926 as the base year. Figure 16 shows the trend of wholesale prices in the United States from 1926 to October, 1928. Table XII on page 336 shows the purchasing power of the 1926 dollar in October, 1928, for all commodities and for separate groups of commodities.

The comments of the bureau throw considerable light on the diversity of price movements of different kinds of commodities.

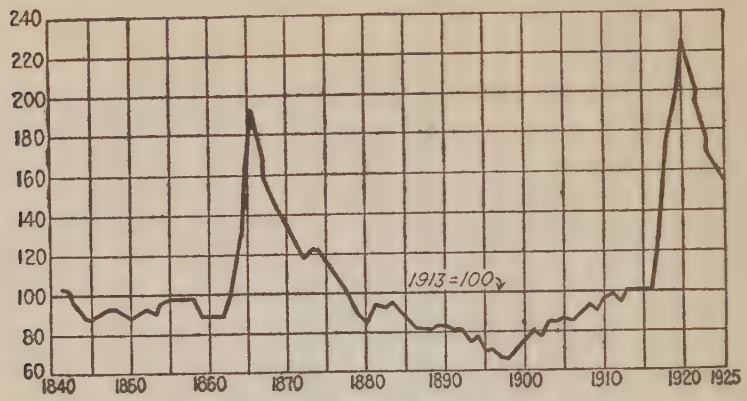


FIG. 15.

Index Numbers of Wholesale Prices in October, 1928.

A reaction from the recent upward trend of wholesale prices is shown for October by information collected in representative markets by the Bureau of Labor Statistics of the U. S. Department of Labor. The bureau's weighted index number, computed on prices in the year 1926 as the base and including 550 commodities or price series, stands at 97.8 for October compared with 100.1 for September, a decrease of nearly 2⅓ per cent. Compared with October, 1927, however, with an index number of 97, an increase of over three-fourths of 1 per cent is shown.

Farm products led in price declines from the previous month, due, mainly, to marked decreases in cattle, hogs, sheep and lambs, and potatoes. Corn and barley, also, were cheaper, while rye, oats, and most wheat prices were higher. The group as a whole averaged almost 5 per cent lower than in the preceding month. Foods, also, averaged lower, with weakening prices for butter, meats, lard, flour, and sugar.

Hides and leather products likewise showed an appreciable decrease in average prices, while minor decreases were recorded for the groups of fuel and lighting materials and house-furnishing

goods. Negligible price increases took place in the groups of textile products, metals and metal products, building materials, chemicals and drugs, and miscellaneous commodities.

Of the 550 commodities or price series for which comparable information for September and October was collected, increases were shown in 132 and decreases in 142 instances. In 276 instances, no change in price was reported.

Comparing prices in October with those of a year ago, as meas-

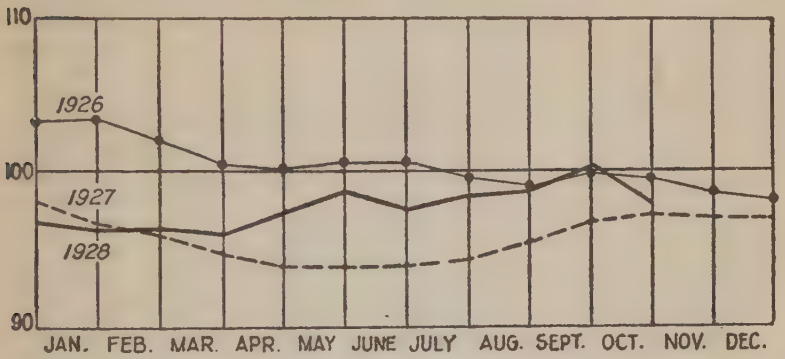


FIG. 16.

ured by changes in the index numbers, it is seen that appreciable increases took place among foods, hides and leather products, fuel and lighting materials, metals and metal products, and building materials. On the other hand, farm products, textile products, chemicals and drugs, and house-furnishing goods were somewhat lower in price, while a considerable decrease took place in the group of miscellaneous commodities.

Changes in the cost of living are better revealed by index numbers of retail prices. On page 336 index numbers prepared by the Bureau of Labor Statistics, indicate the changes which have occurred in the retail prices of principal food articles in the United States from 1913 to October, 1928. The index number for all articles of food combined shows that retail food prices reached their maximum in 1920, when they stood 102 per cent above the 1913 level. Since then they have declined, but in October, 1928, the index registers a 57 per cent increase above 1913. The bureau's weighted index numbers showing

TABLE XII.

INDEX NUMBERS OF WHOLESALE PRICES BY GROUPS AND SUBGROUPS OF COMMODITIES

1926 = 100.0

Groups and subgroups	October, 1927	September, 1928	October, 1928	Purchasing power of the 1926 dollar in October, 1928, cents
All Commodities	97.0	100.1	97.8	102.2
Farm products	105.0	108.8	103.5	96.6
Grains	99.2	97.5	96.6	103.5
Live stock and poultry	105.5	124.0	106.4	94.0
Other farm products	106.7	102.3	103.9	96.2
Foods	100.0	106.9	102.3	97.8
Butter, cheese, and milk	107.2	109.3	108.4	92.3
Meats	100.0	126.5	116.4	85.9
Other foods	97.2	94.0	91.2	109.6
Hides and leather products	113.0	120.7	117.5	85.1
Hides and skins	128.0	141.9	129.9	77.0
Leather	116.5	126.2	124.2	80.5
Boots and shoes	105.6	110.8	110.4	90.6
Other leather products	108.9	109.0	109.0	91.7
Textile products	98.4	95.6	96.1	104.1
Cotton goods	106.0	100.1	100.7	99.3
Silk and rayon	85.4	82.7	84.4	118.5
Woolen and worsted goods	98.0	100.1	100.0	100.0
Other textile products	95.7	86.5	86.1	116.1
Fuel and lighting	83.8	85.1	84.9	117.8
Anthracite coal	96.9	91.2	91.2	109.6
Bituminous coal	99.6	93.2	93.9	106.5
Coke	93.9	84.9	85.0	117.6
Manufactured gas	97.5	94.6	*	
Petroleum products	67.5	77.1	76.3	131.1
Metals and metal products	97.1	100.5	101.0	99.0
Iron and steel	94.0	94.7	95.1	105.2
Non-ferrous metals	89.9	93.8	95.8	104.4
Agricultural implements	98.9	98.8	98.8	101.2
Automobiles	102.2	108.7	108.7	92.0
Other metal products	100.7	96.9	96.9	103.2

* Data not yet available.

INDEX NUMBERS OF WHOLESALE PRICES BY GROUPS AND SUBGROUPS OF COMMODITIES—*Continued*

Groups and subgroups	October, 1927	September, 1928	October, 1928	Purchasing power of the 1926 dollar in October, 1928, cents
Building materials	91.6	94.7	95.0	105.3
Lumber	91.2	91.3	91.7	109.1
Brick	93.3	92.4	92.4	108.2
Cement	96.5	94.6	94.6	105.7
Structural steel	91.9	94.5	94.5	105.8
Paint materials	87.0	85.8	87.1	114.8
Other building materials	91.7	104.2	104.3	95.9
Chemicals and drugs	97.1	95.1	95.6	104.6
Chemicals	101.8	101.1	101.8	98.2
Drugs and pharmaceuticals	86.2	70.1	70.7	141.4
Fertilizer materials	94.1	93.5	93.8	106.6
Fertilizers	92.5	97.5	97.5	102.6
House-furnishing goods	98.5	97.2	96.5	103.6
Furniture	97.0	97.5	95.5	104.7
Furnishings	99.4	97.0	97.1	103.0
Miscellaneous	88.3	79.7	80.3	124.5
Cattle feed	116.7	121.1	128.2	78.0
Paper and pulp	91.6	88.8	89.0	112.4
Rubber	70.5	38.1	38.8	257.7
Automobile tires	74.9	61.6	60.9	164.2
Other miscellaneous	99.9	98.0	98.5	101.5
Raw materials	99.5	100.5	97.4	102.7
Semimanufactured articles	97.6	96.9	96.9	103.2
Finished products	95.5	100.5	98.5	101.5
Non-agricultural commodities	94.8	97.8	96.4	103.7

changes in the cost of living indicate that by June, 1920, the cost of living in the United States had more than doubled and that in October, 1928, it was 70 per cent higher than in 1913.

Index Numbers of Retail Prices of Food in the United States.

In Table 13, index numbers are given which show the changes in the retail prices of specified food articles, by years for 1913 and 1920 to 1927, by months for 1927, and for January through

October, 1928. These index numbers, or relative prices, are based on the year 1913 as 100 and are computed by dividing the average price of each commodity for each month and each year by

TABLE XIII.—INDEX NUMBERS OF RETAIL PRICES OF PRINCIPAL ARTICLES OF FOOD BY YEARS 1913, 1920 TO 1927, BY MONTHS FOR 1927, AND FOR JANUARY THROUGH OCTOBER, 1928

Average for year 1913 = 100.0

Year and month	Sirloin steak	Round steak	Rib roast	Chuck roast	Plate beef	Pork chops	Bacon	Ham	Hens	Milk	Butter
1913...	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100 0	100.0	100.0
1920...	172.1	177.1	167.7	163.8	151.2	201.4	193.7	206.3	209.9	187.6	183.0
1921...	152.8	154.3	147.0	132.5	118.2	166.2	158.2	181.4	186.4	164.0	135.0
1922...	147.2	144.8	139.4	123.1	105.8	157.1	147.4	181.4	169.0	147.2	125.1
1923...	153.9	150.2	143.4	126.3	106.6	144.8	144.8	169.1	164.3	155.1	144.7
1924...	155.9	151.6	145.5	130.0	109.1	146.7	139.6	168.4	165.7	155.1	135.0
1925...	159.8	155.6	149.5	135.0	114.1	174.3	173.0	195.5	171.8	157.3	143.1
1926...	162.6	159.6	153.0	140.6	120.7	188.1	186.3	213.4	182.2	157.3	138.6
1927...	167.7	166.4	158.1	148.1	127.3	175.2	174.8	204.5	173.2	158.4	145.2
1927											
Jan....	160.6	158.3	153.0	141.9	124.0	174.3	181.1	211.2	180.8	158.4	152.5
Feb....	161.0	158.7	153.5	141.9	123.1	171.0	179.6	210.8	180.8	158.4	153.5
March..	161.8	159.6	153.5	142.5	123.1	174.3	179.3	210.0	181.7	158.4	154.6
April...	164.6	163.2	156.1	145.6	125.6	175.7	178.2	210.8	182.6	157.3	152.5
May...	166.5	165.5	157.6	146.9	125.6	173.3	176.3	209.3	180.3	156.2	139.4
June...	166.9	165.9	157.1	146.9	125.6	165.2	174.4	206.3	170.4	156.2	135.2
July...	171.7	170.0	160.1	149.4	126.4	166.2	172.6	203.0	167.1	157.3	134.2
August.	172.0	170.9	160.1	149.4	126.4	179.5	172.2	201.9	166.2	158.4	134.2
Sept...	172.4	170.9	160.6	150.0	128.1	193.8	172.2	200.0	166.2	158.4	139.4
Oct....	172.0	170.0	161.1	151.9	130.6	197.6	172.6	199.3	167.6	159.6	145.4
Nov...	171.3	169.5	161.1	153.1	133.9	172.9	171.5	197.0	167.1	159.6	147.3
Dec....	172.8	171.3	163.6	156.9	138.0	156.2	167.8	192.9	167.6	160.7	152.5
1928											
Jan....	174.8	173.1	165.2	158.8	142.1	149.0	165.2	192.2	172.8	160.7	150.9
Feb....	176.4	174.4	167.2	160.6	144.6	140.5	161.9	190.3	174.6	160.7	147.0
March..	176.8	175.3	167.2	161.3	146.3	136.2	159.3	187.7	174.6	159.6	149.6
April...	178.3	177.6	168.7	163.1	147.9	149.0	158.9	188.1	177.0	158.4	143.9
May...	181.5	181.2	172.2	166.3	150.4	168.6	159.6	190.3	177.0	158.4	142.6
June...	186.6	186.5	175.3	172.5	152.9	165.7	160.0	192.2	174.2	157.3	140.7
July...	195.7	196.9	181.8	180.6	157.9	177.6	162.6	198.5	172.3	158.4	141.8
Aug....	200.8	202.2	184.8	185.0	162.0	190.0	165.9	204.5	172.8	158.4	144.7
Sept...	203.9	205.4	188.9	190.0	170.2	211.0	168.1	208.2	177.9	159.6	150.4
Oct....	198.0	200.0	185.9	188.8	171.9	179.0	167.8	206.7	177.9	159.6	150.1

the average price of that commodity for 1913. These figures must be used with caution. For example, the relative price of sirloin steak for the year 1926 was 162.6, which means that the

average money price for the year 1926 was 62.6 per cent higher than the average money price for the year 1913. As compared with the relative price 159.8 in 1925, the figures for 1926 show an increase of nearly three points but an increase of 1.75 per cent in the year.

In the last column of Table 13 are given index numbers showing changes in the retail cost of all articles of food combined. Since January, 1921, these index numbers have been computed

Cheese	Lard	Eggs	Bread	Flour	Corn meal	Rice	Potatoes	Sugar	Tea	Coffee	All articles [1]
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
188.2	186.7	197.4	205.4	245.5	216.7	200.0	370.6	352.7	134.7	157.7	203.4
153.9	113.9	147.5	176.8	175.8	150.0	109.2	182.4	145.5	128.1	121.8	153.3
148.9	107.6	128.7	155.4	154.5	130.0	109.2	164.7	132.7	125.2	121.1	141.6
167.0	112.0	134.8	155.4	142.4	136.7	109.2	170.6	183.6	127.8	126.5	146.2
159.7	120.3	138.6	157.1	148.5	156.7	116.1	158.8	167.3	131.4	145.3	145.9
166.1	147.5	151.0	167.9	184.8	180.0	127.6	211.8	130.9	138.8	172.8	157.4
165.6	138.6	140.6	167.9	181.8	170.0	133.3	288.2	125.5	141.0	171.1	160.6
170.1	122.2	131.0	166.1	166.7	173.3	123.0	223.5	132.8	142.5	162.1	155.4
170.1	126.6	162.0	167.9	169.7	170.0	126.4	235.3	136.4	142.5	168.5	159.3
170.1	124.1	128.1	167.9	169.7	170.0	124.1	223.5	136.4	142.3	167.4	156.0
168.8	122.8	102.6	167.9	166.7	170.0	124.1	217.6	134.5	142.6	165.4	153.8
167.9	120.9	98.3	167.9	166.7	170.0	123.0	217.6	132.7	142.6	163.8	153.6
167.4	120.3	97.4	167.9	166.7	170.0	121.8	264.7	132.7	142.3	161.7	155.4
167.4	119.0	97.1	166.1	166.7	173.3	123.0	352.9	132.7	142.1	160.7	158.5
167.0	119.0	107.0	166.1	166.7	173.3	123.0	247.1	134.5	142.5	159.7	153.4
167.4	119.6	121.7	166.1	169.7	173.3	123.0	200.0	132.7	142.6	159.1	152.4
170.6	121.5	141.2	166.1	166.7	173.3	121.8	188.2	130.9	141.9	158.7	154.0
173.3	124.1	164.1	166.1	166.7	173.3	120.7	176.5	130.9	142.5	159.1	156.1
174.7	123.4	178.8	166.1	163.6	173.3	119.5	176.5	130.9	142.5	160.4	156.5
176.5	121.5	172.8	164.3	163.6	173.3	118.4	176.5	129.1	142.1	161.4	155.9
177.4	119.6	162.0	164.3	160.6	173.3	117.2	176.5	129.1	142.3	162.8	155.1
177.4	115.8	124.9	164.3	160.6	173.3	117.2	176.5	129.1	142.1	163.1	151.6
174.2	112.7	107.2	162.5	160.6	173.3	116.1	200.0	129.1	142.3	163.8	151.4
172.9	112.7	103.8	162.5	163.6	176.7	114.9	205.9	129.1	141.9	164.1	152.1
172.4	114.6	108.7	162.5	169.7	176.7	114.9	194.1	130.9	141.9	164.4	153.8
172.4	115.2	112.5	164.3	172.7	176.7	113.8	170.6	132.7	142.1	165.1	152.6
173.3	116.5	120.6	164.3	169.7	176.7	114.9	135.3	132.7	142.3	165.1	152.8
173.8	118.4	130.4	164.3	163.6	176.7	113.8	129.4	129.1	142.3	165.8	154.2
175.1	122.2	146.1	162.5	160.6	176.7	114.9	129.4	127.3	142.3	166.1	157.8
175.6	123.4	157.1	162.5	157.6	176.7	113.8	129.4	125.5	142.1	166.4	156.8

[1] Twenty-two articles in 1913–1920; forty-three articles in 1921–1928.

from the average prices of the articles of food weighted according to the average family consumption in 1918. Although

previous to January, 1921, the number of food articles has varied, these index numbers have been so computed as to be strictly comparable for the entire period. The index numbers based on the average for the year 1913 as 100 are 157.8 for September, 1928, and 156.8 for October, 1928.

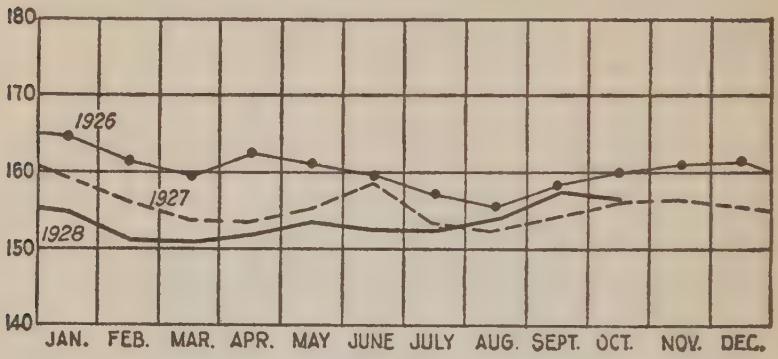


FIG. 17.

The curve shown in the chart on this page pictures more readily to the eye the changes in the cost of the food budget than do the index numbers given in the table.

Changes in Cost of Living in the United States.

The cost of living in the United States in June, 1928, was 1.2 per cent lower than in December preceding and 2.0 per cent less than in June, 1927, according to the data compiled by the Bureau of Labor Statistics in its semiannual survey of cost of living in various cities. These data, together with the data that have been given in previous reports, are shown in the table following. The information is based on actual prices secured from merchants and dealers for each of the periods named. The prices of food and of fuel and light (which include coal, wood, gas, electricity, and kerosene) are furnished the bureau in accordance with arrangements made with establishments through personal visits of the bureau's agents. In each city, food prices are secured from fifteen to twenty-five merchants and dealers, and fuel and light prices from ten to fifteen firms, including public utilities. All other data are secured by special agents of the bureau, who visit the various merchants, dealers, and agents and secure the figures

directly from their records. Four quotations are secured in each city (except in Greater New York, where five are obtained) on each of a large number of articles of clothing, furniture, and miscellaneous items. The number of houses and apartments for which basic rental figures are shown vary in the different cities approximately in proportion to population, the number per city, in round numbers, ranging from 400 to 2,200.

In the following table are given index numbers, with 1913 as the base or 100, showing changes in the total cost of living in the United States from 1913 to June, 1928.

TABLE XIV.

INDEX NUMBERS SHOWING CHANGES IN COST OF LIVING IN THE UNITED STATES, 1913, TO JUNE, 1928

Date	Index numbers	Date	Index numbers	Date	Index numbers
Average, 1913.....	100.0	May, 1921.....	180.4	March, 1924.....	170.4
		September, 1921....	177.3	June, 1924.....	169.1
December, 1914....	103.0	December, 1921....	174.3	September, 1924....	170.6
December, 1915....	105.1	March, 1922.....	166.9	December, 1924....	172.5
December, 1916....	118.3	June, 1922.....	166.4	June, 1925.....	173.5
December, 1917....	142.4	September, 1922....	166.3	December, 1925....	177.9
December, 1918....	174.4	December, 1922....	169.5	June, 1926.....	174.8
June, 1919.....	177.3	March, 1923.....	168.8	December, 1926....	175.6
December, 1919....	199.3	June, 1923.....	169.7	June, 1927.....	173.4
June, 1920.....	216.5	September, 1923....	172.1	December, 1927....	172.0
December, 1920....	200.4	December, 1923....	173.2	June, 1928.....	170.0

Summary.

The value of money changes in inverse ratio to changes in the general price level. Changes in the general level of prices are measured by means of an index number. An index number is a summary of the price changes of a selected list of commodities used to indicate changes in the level of prices in general. To perform this function it should be based on a carefully selected representative list of commodities. The crudest method of constructing an index number is to add the actual prices of the selected commodities for each period and compare their sums. To avoid the inaccuracies of this method, the actual prices are turned into relative prices based on 100. The prices of the commodities

at different periods are expressed as percentages of their prices at the period chosen as the base. By adding these relative numbers for each period and dividing by their number, the final index number is found. In distinction to a "simple" index number based on the single price of each article is the "weighted" index number, wherein the price of each commodity is multiplied by some number to accord it an influence on the result in proportion to its economic importance. An index number based on a large number of carefully chosen commodities weighted in accordance with their economic importance will reflect changes in the general level of prices with greater accuracy. The most recent index of wholesale prices prepared by the U. S. Bureau of Labor Statistics uses 1926 as the base year and is a weighted index comprising 500 carefully selected commodities.

The chart on page 334 shows the upward and downward swings in the general price level of the United States during the last eighty-five years. In 1920, the index shows wholesale prices to have risen 125 per cent above their level at 1913, which indicates that the value of a dollar in wholesale transactions had depreciated 56 per cent since 1913. The Department of Labor's retail index number based on the cost of twenty-two food articles, weighted according to the importance of each article in the consumption of the average family, indicates that the value of a dollar in a family's expenditure for food was about one-half of what it was in 1913.

The department's index number showing changes in the cost of living in the United States, from 1913 to 1928, indicates that there has been an increase of 70 per cent in the cost of living since 1913.

Test Questions

1. What is an index number?
2. Why would an index number based on farm products not be satisfactory as an indication of rises and falls in the general level of prices?
3. Construct an index number based on the relative prices of six commodities, using 1913 as the base year.
4. What is a *weighted* index?
5. In what year did wholesale prices reach the top of their rise after the World War?

CHAPTER XXIII

CAUSES AND EFFECTS OF PRICE CHANGES AND FOREIGN EXCHANGE

Causes of Changes in the Value of Money or Level of Prices.

In order to gain an insight into the causes of price changes, the first point to notice is that they are the resultant of two distinct groups of forces. A price is an expression of the exchange relation existing between two things, money and a commodity. An index number or relative price expresses a change in the relation that exists between money and commodities in general, and such a change may be brought about by causes directly affecting money or by those influencing commodities; or by the combined action of both.

The value of money is determined, as is the value of all other things, by the supply of it in relation to the demand for it. Now, the demand for money arises from the commodities that are to be exchanged. At any given price level, an increase in the number of commodities to be exchanged involves an increase in the demand for money. Changes in the value of money or the level of prices will, therefore, be brought about by causes, on the one hand, that operate to increase or decrease the supply of money and, on the other, by causes increasing or decreasing the volume of trade or the number of exchanges to be transacted through the agency of money.

Influence of the Supply of Money on the Price Level.

In considering the supply of money, we must take into account not only the quantity of money, namely gold, but also the amount of supplementary money and deposit currency, changes in the quantities of which are, in effect, equivalent to changes in the supply of money. An increase in deposit currency, for instance, since it affects exchanges as readily as money itself, will

be tantamount to a decrease in the demand for money or, from our present point of view, to any increase in the supply of money. We must also allow for the rapidity of circulation of money and currency. It is evident that if, in a given period, 10,000,000 exchanges are to be made at $1 apiece, $10,000,000 will be required if each dollar is used only once, but if each dollar is used five times, $2,000,000 will suffice to do the work. In any given day, week, or month in actual life, the same money is being used several times over. The average number of times money is used in a given period is termed its "rate of turnover" or "rapidity of circulation." An increase in its rapidity of circulation is, thus, equivalent to an increase in its supply.

The quantity theory of money, a veritable bone of contention among economists, stated in its strictest form, asserts that the value of money, other things being equal, varies in a ratio exactly inverse to its supply: "supply" meaning the quantity of standard money or gold. The number of "other things," however, is so large and their likelihood of remaining equal so unlikely that a broader statement is, perhaps, more apt to be descriptive of actual facts. If all exchanges in a country were made with gold and the price level were suddenly doubled so that 2 cent stamps cost 4, nickel articles a dime, and so on, it would be true that everybody would need just twice as much money to make the same purchases. Such a doubling of prices could not possibly occur without a doubling of the money supply. In the same manner, were the money supply of the country suddenly doubled, prices would rise 100 per cent; or, were the quantity of money to be reduced one-half, to effect the same number of exchanges, prices must be reduced one-half. In actual affairs, however, an increase in the supply of gold does not affect prices in the simple and direct way indicated above but in a roundabout and indirect manner, by wending its way into circulation or swelling the reserves of the banks, their capacity to loan, and, finally, increasing the currency. In the meantime, "other things" may intervene, exaggerating or nullifying its effects; a development of the banking system by extending the use of credit or a business boom by expanding credit may magnify its results; a contraction of credit or an increase in the volume of trade due to industrial progress may negative it. A

more moderate statement that squares with the facts would be that an increase in the supply of money or any increase in the currency tends to decrease the value of money or raise the level of prices.

The effect of an increase of gold on prices is clearly seen in the general rise in prices that took place the world over following the gold discoveries in 1848 and 1849 in Australia and California, discoveries which increased the annual output of gold from $40,000,000, in 1850, to $150,000,000, in 1853. Saurbeck's index registers a rise in the period between 1852 and 1873 of 38 per cent in English prices. In this country, of course, the rise was accentuated by causes affecting the other side of the price equation, due to the influence of the Civil War on commodities. A second period which illustrates the effect not only of an increase in gold but also of a more than proportionate increase in the quantity of the other forms of currency based on gold, dates from 1896, when the price levels of the great nations of the world advanced in unison. In the early 'nineties, gold production took another sudden leap ahead, the world's output increasing from 200 tons, in 1890, to 700, in 1910. In addition to the increased supply of gold, particularly in the United States, the rapid strides made in the development of the banking and credit systems resulted in an increase of credit currency based on gold, especially in the form of deposit currency. In spite of the extension of trade occurring in these periods, the net result was a world-wide increase in prices.

Demand for Money or the Volume of Trade.

Quite apart from causes which influence prices on the money side are those which affect them from the commodity side. At any given price level, an increase in the volume of exchanges to be transacted will tend to lower prices by increasing the demand for money; conversely, a falling off in the volume of trade or the total number of exchange transactions is the product of the number of commodities multiplied by their rate of turnover. Many and varied are the influences that play upon the volume of trade. Chief among those tending to increase the number of exchanges and lower prices are science, invention, development of transportation, labor-saving machinery, division

of labor, improved processes of production and organization, and increases in the population. On the other side, we have wars, monopoly, high tariffs, strikes, etc.

The fall of prices that occurred among the great nations of the world between 1873 and 1896 is generally conceded to have been caused by the fact that the volume of trade, stimulated by the remarkable advance of industrial progress, increased at a more rapid rate than did the supply of money. The late abnormal rise in the price levels the world over was due to just the opposite situation—to the shortage of commodities following in the train of the World War, with its destruction of wealth and withdrawal of labor from the usual channels of production, accompanied, also, as in most wars, by an artificial expansion of credit.

To sum up, there are two direct causes of price changes: the supply of money or the total volume of currency, and the total number of commodities to be exchanged or the volume of trade. All forces influencing prices may be divided into two groups according as they work through one or the other of the above. Action and reaction occur between these two causes; an increase in the supply of money, for instance, may and usually does result in an increase in trade; and action and reaction may take place between these two causes and the result. The supply of money and the volume of trade may both be influenced by changes in the price level, the result, in its turn, becoming the cause.

Effects of Changes in the Value of Money or Prices.

While it matters little whether prices are permanently high or low, the difference involving merely a greater or fewer number of counters with which to effect the exchanges of wealth, *rising* or *falling* prices are of considerable moment. Any change in the standard which serves as a measure of values is bound to result in disturbing effects. And though such changes in normal times may take place but slowly, the modern set toward long-time production and long-term contracts renders them particularly undesirable. In a period of rising prices, the debtor gains at the expense of the creditor, for though he pays the stipulated sum of money, his creditor receives less purchasing

power, or value in turn of commodities. In this situation, landlords whose land is let on long leases, holders of mortgages or bonds, depositors in banks who withdraw their money after a number of years are the losers. A man who in January, 1920, drew $100 out of a savings bank in which he had deposited it in 1913 would receive a sum of money equivalent in purchasing power to about $40 of his original deposit. In periods of falling prices, the reverse is true—the creditors gain at the expense of the debtors.

But the most disturbing effects of price changes occur in the field of distribution, where they play fast and loose with the incomes of the people, enriching some and impoverishing others.

A rise in the price level is detrimental to all who derive their incomes from fixed-interest securities and to those in business whose expenses increase with the rise in prices but who are unable to increase their charges such as railways, street-car companies, and public-utility concerns. Wage earners as a class suffer, as wages do not advance so rapidly as prices. Among wage earners, those whose remuneration is fixed by law or custom, such as teachers and government employees and the salaried class, generally, whose stipends are relatively stable, are the worst sufferers. On the other hand, falling prices usually mean an increase in the real wages of the workers, as they display as a class more stubbornness in resisting a cut than skill in securing an advance. Business men as a class benefit by rising prices, which to them are synonymous with rising profits. Raw materials are usually contracted for in advance, and a rise in the price of the finished product means an extra profit. As the wages of labor lag behind commodity prices, those entrepreneurs whose costs consist, for the most part, of wages reap the largest profits; labor's loss is their gain. When prices are advancing all along the line, particularly if there is an acute shortage of commodities such as existed during the postwar period, the game is largely in the hands of the entrepreneurs, and judging by the income-tax returns, they did not neglect their opportunity.

A period of falling prices is, for reasons reverse to the above, apt to entail losses to the business class generally. There is no doubt that business men the world over hate falling prices, though, as far as the country at large is concerned, a period of

falling prices due to industrial progress may mean the greatest good for the greatest number. The psychological effect, however, of a rise in the price level on the entrepreneur class, stimulating business enterprise as it no doubt does, benefits the whole community even though the builders do feather their own nests first.

Foreign Exchange.

While the buying and selling of commodities within a country is carried on in terms of the standard money of the realm, trade between one nation and another may be transacted in terms of the money of either and involves an exchange of the money of the one in terms of the money of the other. If an American importer buys a bill of goods from a London merchant, the purchase might be made in terms of dollars or pounds, though custom and convenience both favor the latter. Let us suppose that the bill amounts to £1,000. Our importer could actually ship sufficient American gold dollars or bullion to be coined into 1,000 sovereigns in London and thus discharge his debt. Owing to the expense and inconvenience, he will be more likely to purchase from his banker a draft on London for £1,000, that is, a claim to the payment of pounds sterling in London which he mails to his English creditor. Such a transaction, strictly speaking, consists of the exchange of a claim to American dollars payable in the United States for a claim to English pounds payable in England. By "foreign exchange" is meant the exchange of the money of one country for that of another.

The Par Rate of Exchange and the Gold Points.

The question is, How many dollars should the American pay for the £1,000, or what determines the rate of exchange between the two moneys? Were it merely a matter of exchanging gold dollars for gold sovereigns, the answer would be easy, for there are 4.866 times the quantity of fine gold in an English pound sterling as in an American dollar; 1 "sovereign," as the English coin is called, would be worth $4.866, and 1,000 would be worth $4,866 plus. But the American dollars lie on one side

of the Atlantic, the sovereigns on the other, and to ship them across costs in both time and money. The importer will prefer to purchase a draft, provided the rate or price per pound sterling does not exceed $4.866 plus what it would cost him to ship the actual gold which includes freight, insurance, loss of interest in transit, etc., amounting to, perhaps, 2 cents on each pound sterling. Should, however, the price of "sterling exchange" rise above this point of $4.866, importers and others having debts to pay in London will find it cheaper to ship gold.

Likewise, if the rate falls below $4.866—the "par of exchange," as it is termed—by an amount exceeding the cost of transportation, exporters and others having claims against Englishmen entitling them to the payment of pounds sterling in London will find it cheaper to have the gold coins shipped over here and turned into American dollars then to sell their claims at such a low rate. Suppose, for instance, that an American exporter has sold a bill of goods to an English concern for £1,000. He might, in the usual course, draw a draft, or "bill of exchange," as it is termed, on his English customer for £1,000, which he would sell to his banker at the current rate. But should the rate for such bills of exchange be below $4.846 plus, it would pay him to have the actual gold shipped over, for, after deducting the cost of transportation, etc., which would amount to about $20, he would receive $4,846.

These two points in the rate of foreign exchange above or below which it becomes profitable to ship gold are termed the "gold points" or "specie points." In normal times, the rate of exchange will not rise above or fall below them. In actual affairs, the shipping of bullion is not likely to be done by exporters but by international bankers and bullion dealers, who make a practice of buying and selling drafts and bills of exchange on foreign countries. As the rate rises or falls above or below the gold points, it becomes profitable for them to ship bullion across the Atlantic. By shipping gold, they are able to establish their balances in London at a cost of $4.886 plus per pound sterling. If they are able to sell drafts on these balances in New York, say at $4.89, they make a profit. Consequently, if the rate of exchange were to rise above $4.886 plus, there would

arise an unlimited supply of sterling bills; competition among the sellers to dispose of them at that price would be so keen that the rate of exchange would fall below the upper gold point.

Should the rate fall below $4.846, bankers in New York would buy up all the bills possible, send them across, ship back the gold to which they are entitled, and have it coined into American dollars at the rate of $4.866 plus, per pound sterling. Deducting the cost of transportation, they would net $4.846 for each pound sterling. If they could buy sterling bills on London at the rate of $4.83 plus and realize on them at the rate of $4.84 plus, there would arise an unlimited demand for sterling exchange and the rate would rise. The gold points will, of course, vary with freight charges, insurance, and interest rates.

What Determines the Actual Rate of Foreign Exchange.

We have still to discover what causes the fluctuations of the rate exchange from day to day, between the gold points. In general, it may be said that the rate at which the money of our country will exchange for that of another is determined by the demand for it in relation to the supply of it. The demand depends on the indebtedness of all other countries to it; the supply, on its indebtedness to all other countries; so that the relation between demand and supply will depend on the relative indebtedness of the given nation to the rest of the world. Should the country in question be selling more to foreign countries than it is buying from them, the demand for its money will exceed the supply and the rate of exchange will rise in its favor, and *vice versa.*

If, for example, the United States is buying heavily from Great Britain, there will arise an urgent demand on the part of American importers and others for drafts and bills of exchange on London with which to pay their debts, and the rate of sterling exchange in New York will rise. On the other hand, should the United States be selling to Great Britain more than she is buying from Great Britain, there will be a larger supply of bills of exchange in the possession of exporters who have claims on Englishmen to sell than there will be a demand by importers to purchase such bills, and, in consequence, the rate would fall.

The rate of sterling exchange, however, does not depend solely on the relative indebtedness of Great Britain and the United States but on their indebtedness to other countries, and *vice versa*. Great Britain may be importing more from the United States than she is exporting to the States. But, in turn, the United States may be importing more from Brazil than she is exporting to Brazil; while Brazil's imports from Great Britain may exceed her exports. As a result of the first condition, there would arise in New York an excess of sterling bills on London, which, however, would be counterbalanced by the demand from American importers of coffee from Brazil for sterling bills with which to pay their Brazilian creditors. In Brazil, these bills would be readily purchased by importers to remit to London in payment of the manufactured goods which they buy from Great Britain. Thus, the rate for pounds sterling in New York is influenced not only by Great Britain's trade with the United States but also by her trade with Brazil and, likewise, with all other foreign countries.

Furthermore, in considering the indebtedness of a country, account must be taken not only of its recorded exports and imports but also of its "invisible" exports and imports. Part of the trade between nations consists not only of physical commodities but also of bonds and stocks, interest and dividend payments, insurance, banking, and transportation. In normal times, the United States exports more to Great Britain than she imports, as far as material commodities are concerned, but Great Britain performs certain services for which the United States must pay, and which help to swell the invisible imports and thus increase the demand for pounds sterling in terms of which they must be paid. For example, the bulk of American freight is carried in British ships; London in her position of international banker renders services for which Americans among others must pay; large sums are remitted annually to British owners of American bonds and stocks in the form of interest and dividends; millions are paid in insurance premiums to British companies; services are rendered to American tourists abroad whose letters of credit add to the demand for sterling exchange; all help to swell the invisible indebtedness of the States to Great Britain. Apparently, the "balance of trade" may be against a country, that is,

the recorded imports may exceed the exports, when, in reality, the invisible exports may tip the scales in her favor.

Influence of the Movement of Gold and Changes in the Price Level.

Though for short periods the total exports of a country may be either greater or less than its imports, in the long run there are world forces at work that tend to make them equal. If a country continues buying from foreign countries more than it is selling, the rate at which its money exchanges for that of other countries will fall, till, finally, the lower gold point will be passed and gold will be exported. By virtue of the connection between the quantity of gold and the price level within the country, the lessening of the gold supply will result in a lowering of prices, while the price level of the countries to which the gold has been shipped will tend to be raised. This dual condition will discourage imports and stimulate exports, and the exchange rate will rise. In the case of a country exporting more than it is importing, just the opposite effect will result. Gold will finally be imported, prices will rise, the higher prices within the country will attract imports, the comparatively lower prices outside will discourage exports, and the balance of trade will again be restored.

Foreign trade is in essence similar to domestic and consists of an exchange of commodities and services between nations. Payment is effected through the agency of international bankers by offseting contrary claims through the medium of the draft or bill of exchange. In a given nation, exporters and others in the possession of claims against foreign countries sell these claims to importers who use them to cancel claims which other nations have against them. When the exports and imports of a country are equal, these claims exactly offset each other. When they are not equal, one nation will have more claims on other nations than they have on it, gold must eventually be shipped in settlement, and gold by its influence on the price level tends automatically to rectify the inequality in the balance of trade, so that the ebb and flow of the tides of international trade are impelled by fundamental laws. Trade between nations as between individuals must be based on an exchange of commodities

and services; no one nation can permanently sell to other nations more than it buys—a fair exchange the law ever seeks. An understanding of this law makes clear the fallacy involved in the theory of a "favorable balance of trade." According to this theory, it is thought that a nation should sell to other nations more than it buys from them. It will then have a continual stream of money flowing into it as a result of the balance in its favor and will thus be permanently enriched at the expense of others. Such a situation, however, is a permanent impossibility; it contains within itself the seeds of its own destruction, for the continuous flow of money into the country by its action on the price level will inevitably check exports, stimulate imports, and the favorable balance will vanish.

The Discount Rate and the Rate of Foreign Exchange.

An important factor influencing the supply of foreign bills and the exchange rate is the prevailing rate of interest. Capital flows to those centers where the price for its use is highest. Should interest rates be high in New York, international bankers in foreign countries will transfer their loanable funds there. The cheapest way to increase their balances in New York is to draw drafts on London. These drafts, drawn for the purpose of creating funds in New York, are termed "finance bills." A London banker instructs his New York correspondent to draw on him. The drafts thus created are sold in New York to importers or others having debts to pay abroad, and the proceeds are loaned at the high rate of interest prevailing. This, of course, tends to increase the supply of sterling bills and, thus, lower the exchange rate. Should this condition continue, the rate may drop below the lower specie point and gold be imported. The placing of the discount rate of a country in the hands of a central power, such as for years has been the case in Great Britain and is now by the Federal Reserve Act in the United States, therefore, enables a nation to control, in a measure, its gold supply. In the past, when gold has flowed out of England in such a degree as to endanger the reserves of her monetary system, the Bank of England has merely raised the discount rate, capital has been attracted, the exchange rate lowered, and the importation of gold followed.

When Bullion is Not Obtainable.

While under normal conditions the rate of exchange between two countries will stay within the specie points, should there be an embargo placed on the shipment of bullion or should bullion for any reason be unobtainable in one country, there is no limit to which the exchange rate may not go. Suppose that Russia has placed an embargo on the exportation of bullion and a Russian importer has purchased a bill of cotton goods from Manchester for which he has contracted to pay £1,000. Debarred from exporting bullion, his only course, outside of shipping commodities and selling them in Great Britain for sovereigns, is to purchase with his paper roubles a sterling bill in Leningrad, from a banker or exporter who has a claim on someone in London to the payment of pounds sterling. Should imports exceed exports, as would likely be the case, he might have difficulty in obtaining a bill at all; the demand would exceed the supply, and the price of sterling bills might rise to any height. Such has been the case with some European countries since the war, when the rate of exchange for their currencies in pounds sterling or American dollars has risen sky high. When the free movement of gold or specie is interfered with between nations, the rate of foreign exchange is determined entirely by supply and demand and may fall or rise to any height.

In the case of a country with a depreciated currency or in which there is a premium on gold, the rate of exchange will fluctuate in proportion to the premium on gold. To find the specie points, there must be added or substracted from the par rate, in addition to the expenses of shipment, the premium on bullion. For example, if the currency of a country, owing to an excessive issue of paper money, had depreciated 50 per cent so that a dollar bill was worth only one-half a gold dollar, it would take 2 paper dollars to purchase 1 gold dollar. An importer, therefore, who had £100 to pay in London, as an alternative to purchasing a draft, would have to pay 973 paper dollars for the 486 gold dollars with which to discharge his debt, plus the cost of shipment. The upper specie point would be around $9.75. Similarly, an exporter having a claim calling for the payment of £100 in London would not be willing to sell for much less than 970, for by importing the £100 sterling he could obtain 973 paper dollars,

which, after expenses are deducted, would net him around $790. The rate of exchange, then, for a country with a depreciated currency will tend to differ from the ordinary rate in proportion to the premium on gold.

Summary.

Changes in the general level of prices are brought about by two groups of causes, one affecting the supply of money; the other, the volume of trade. An increase in the supply of money and currency tends to raise the price level; a decrease, to lower it. An increase in the volume of trade, the supply of money remaining the same, tends to lower the price level; a decrease, to raise it. The upward movement of prices beginning in 1896 is attributed to the increased influx of gold and, also, an increase in credit currencies. The downward swing of prices between 1873 and 1896 is attributed to the rapid increase in the volume of trade caused by the remarkable industrial developments of that period.

Changing prices, especially rapidly changing prices, have disturbing effects, bringing advantage to some and injury to others. In a period of rising prices, debtors gain at the expense of creditors; the reverse is true in a period of falling prices. As wages lag behind other prices in a period of rising prices, wage earners suffer a loss; but as wages also fall more slowly than other prices, they reap an advantage in a price decline, which, however, may be offset by unemployment. Business men as a class benefit by rising prices as profits tend to increase, but they are the first to suffer in a period of falling prices.

Buying and selling between foreign countries makes necessary the exchange of the money of one country for that of another. By the rate of exchange is meant the amount of one money which must be given in exchange for another. The par rate of exchange is determined by the relative weights of gold in the standard moneys of two countries. In normal times, the rate of exchange will not go above or below the gold points, that is, above or below the cost of exporting or importing gold.

The actual rate of exchange of the money of a given nation will depend on the relation between the supply of it and the demand for it. The supply will depend on the quantity of

goods which it has sold to other countries; the demand, on the quantity of its goods which other countries have bought. That is, the rate of exchange of its money will be the ratio of its exports to its imports. If it is selling more to foreign countries than it is buying, the demand for its money will exceed the supply and the rate of exchange will rise in its favor. In considering the trade between nations, it is important to take into account the invisible exports and imports, as payments for services, such as payments for freight, banking services, and insurance. The movement of gold between countries and its influence on price levels tends to bring about a balance of trade between nations. As the discount rate affects the foreign-exchange rate of a nation's money and, by forcing it up or down to the specie points, causes gold to be exported or imported, some control over the discount rate, such as is now exercised by the Federal Reserve Board, enables the nation to safeguard its gold reserves. While under normal conditions the rate of exchange will stay within the species points, should there be an embargo placed on the shipment of bullion, there is no limit to which the rate of exchange may not go.

Test Questions

1. Under what two heads can causes affecting changes in the general level of prices be grouped?
2. What is the quantity theory of money?
3. What must be taken into consideration in estimating the quantity of money?
4. What factors tend to increase the demand for money?
5. Explain the effect of rising and falling prices on creditors and debtors; on profits and wages.
6. What is the "par of exchange"?
7. Why will the rate of sterling exchange in normal times not rise above or fall below the "gold points"?
8. Where does the demand for sterling exchange spring from?
9. Where does the supply of sterling exchange spring from?
10. How does the interest rate influence the rate of exchange?

References

BARBOUR, SIR D., "The Influence of the Gold Supply on Prices and Profits."

CANNAN, E., "Money—Its Connection with Rising and Falling Prices."

CLAY, H., "Economics for the General Reader," Chap. XI.
ELY, R. T., "Outlines of Economics," Chaps. XVI, XVII.
ESCHER, F., "Elements of Foreign Exchange."
FISKE, G. M., "International Commercial Policies."
FISHER, I., "Stabilizing the Dollar"; "The Purchasing Power of Money."
GOSCHEN, G. J., "Theory of Foreign Exchanges."
JEVONS, W. S., "Money," Chaps. I–XVI, XXV–XXVI, 1879.
JOHNSON, J. F., "Money and Currency," Chaps. I–VIII.
KEMMERER, E. W., "High Prices and Deflation."
LAUGHLIN, J. H., "Money and Prices."
MILL, J. S., "Principles of Political Economy," Book III, Chaps. VII–X.
MITCHELL, W. C., "Business Cycles," "The Making and Using of Index Memoirs," *U. S. Bureau Labor Statistics, Bull.* 173.
PEPPER, C. M., "Foreign Trade."
SEAGER, H. R., "Principles of Economics," Chap. XXI.
SELIGMAN, E. R. A., "Principles of Economics," Chap. XXVIII.
SMITH, A., "Wealth of Nations," Book IV, Chap. II.
TAUSSIG, F. W., "Principles of Economics," "Tariff History in the United States."
WALSH, C. M., "Measurement of Exchange Value," Chaps. III, VI–XII.
WITHERS, H., "Money Changing."

PART IV

ANALYSIS OF THE FOUR FORMS OF INCOME AND FACTORS DETERMINING THEIR AMOUNTS

CHAPTER XXIV

THE DISTRIBUTION OF WEALTH

The term "distribution" in economics refers to the division of the "net dividend" or "national income" among the agents of production by whose cooperation it is produced. This net product proceeds in a continuous flow from the channels of industry and constitutes the net addition made to the wealth of the nation.

A SURVEY OF THE FACTS RESPECTING THE INCOME OF THE UNITED STATES AND ITS DISTRIBUTION

The estimation of the net income of a nation is a task of no mean order, and however much care is used, the figures will be liable to some error. There have been several independent estimates made recently in the United States which, considering the magnitude of the figure, show surprisingly close results. Perhaps the most exhaustive and thorough is that recently conducted under the auspices of the National Bureau of Economic Research by Messrs. King and Knauth.[1] Two separate estimates were made, one, by sources of production, by Mr. King, who ascertained the value product of all industries. The value product of an industry is the excess of the value of its output over the costs of the materials which it consumes, including depreciation and depletion of resources. The second estimate, made by Mr. Knauth, was by incomes received and was based primarily on income-tax returns, supplemented by other data on tax-exempt income, such as the income of certain classes of tax-exempt bonds, salaries of state officials, rental values of homes occupied by owners, food and fuel produced and consumed directly by farmers. These two independent estimates which, when completed, differed

[1] "Income in the United States." For a complete analysis, the reader is referred to this valuable and interesting work.

only by a maximum variation of less than 7 per cent in any one year, were then carefully checked against each other and made the basis for the final estimate. According to the final figures, the national income and the per capita income of the United States for the years 1913–1921 were as follows:

	National income, billions	Per capita income, dollars per annum
1913	$34.4	$354
1914	33.2	335
1915	36.0	358
1916	45.4	446
1917	53.9	523
1918	61.0	586
1919	66.2	630
1920	72.4	680
1921	84.4	779

The Problem of Distribution.

Owing to the remarkable progress in the arts of industry following the industrial revolution, the wealth of the great nations of the world has been tremendously augmented during the last hundred years. Yet at no time has there been more dissatisfaction evinced concerning the division of that wealth. There always has been and probably always will be more or less discontent among individuals over this division, but recently class consciousness, fostered by organization on the side of both capital and labor, has led to clashes of arms that have made even thrones tremble and whole nations cower. It appears that while from the social point of view we have been fairly successful in the production of wealth, we have not yet satisfactorily solved the problem of its distribution. There is no doubt but that the major part of the industrial unrest in this and other countries arises from a more or less vague sense of discontent over the division of the proceeds of industry. Each class suspects that the other is getting a larger share than its due. Many thoughtful people feel that a more equitable division would be desirable. But as to just what is wrong and how it should be remedied, there is consider-

able confusion of opinion. Some blame individual greed, others our economic system, which they would either remodel or rebuild along many and dubious lines; few really understand our present system and have any clear idea of just how distribution is determined under it or the laws and principles operating within that govern the shares of the individual members and classes.

By analyzing separately the net income of the more highly organized industries of mining, large-scale manufacturing, and land transportation, which produce one-third of the national income and wherein the different forms of income are more definitely specified and accounted for, the bureau has been able to furnish some very suggestive facts in reference to the distribution of wealth between "labor and capital." The net income of these industries is split into two parts: that going to hired labor in the form of wages and salaries, on the one hand, and that going to the owners of property as rent, interest and profits, on the other. In most years, 69 to 72 per cent goes to employees, including salaried officials, while 28 to 31 per cent goes to the owners in interest, rents, and profits. In 1913, wages and salaries amounted to $8,651,000,000, or 72 per cent of the total net income, while rents, interest, and profits equaled $3,359,000,000 or 28 per cent of the total. In 1918, the former rose to $17,472,000,000, or 77 per cent of the total, while the latter were $5,124,000,000, or 22 per cent of the net income.

Another interesting question—namely, What is the percentage of the total payroll going to salaried officials?—is very decisively answered by this analysis. It was ascertained that 92 per cent of the total payments to employees went to the rank and file of manual and clerical workers, which leaves only 8 per cent for salaried officials.

In 1918, the average annual earnings of employees normally engaged in the various industries of the nation ranged from $590 in agriculture to $1,590 in water transportation, while the average for all industries was $1,078.

In its analysis of the distribution among individuals, the bureau draws the dividing line between those whose incomes are above or below $2,000. This division, it is suggested, serves as well as any other arbitrary line to distinguish between the modestly well off, who are able to afford at least the comforts and

conveniences of life, and those who can scarcely be called well-to-do. In 1910, only one in twenty-five of those gainfully employed enjoyed incomes exceeding $2,000 a year. This number increased with war times and probably rose to one and one-half out of every ten. The fact remains that in this, the wealthiest country of the world, the great majority are not well-to-do. Of all those engaged in gainful occupations in 1918, 86 per cent earn less than $2,000 per annum. This 86 per cent possess 60 per cent of the national income, while the 14 per cent of those fortunate ones whose incomes exceed $2,000 a year enjoy 40 per cent of the total wealth produced.

In view of the wild statements frequently made in connection with the unequal division of wealth, the impartial and careful analysis made by the bureau into the distribution of the nation's income among classes and individuals is particularly valuable. A little more than half of the net income is paid as wages and salaries to hired labor. This, the bureau points out, is not synonymous with the "share of labor." It would be practically impossible to ascertain, for instance, in the case of agriculture what part of the net products of the numerous small farmers should be attributed to their labor, what should be set down as interest on their capital, etc. It is possible to secure fairly accurate statistics on wages and salaries and so find the relative share of the net income of an industry paid to hired labor. This varies in different industries with the degree of organization and the relative quantities of labor and capital employed. It ranges from one-eighth in farming to three-fourths in mining and manufacturing. In farming, the percentage of wages is small, owing to the fact that the farmer and his family perform a large part of their own work. In banking, the percentage of net income received in the form of wages is also small on account of the small proportion of labor employed to capital. In mining and manufacturing, where a larger percentage of labor is employed, about three-fourths of the net value produced goes to the workers in salaries and wages. The percentage for industry as a whole is held down by the low percentage of wages paid in farming. The figures also bring out the fact that the share of the net product going to hired labor varies from year to year according to business conditions. It fell with the sudden rise in prices

in 1914 to 1916 but rose again with the advance in wages in 1917 to 1918. In 1918, the workers secured a larger share of the net product of industry than in 1909 but not so large as in 1913. The value of housewives' services is not included in the above. Such an estimate must be a matter of conjecture. The bureau estimates that, roughly, the value of these services in 1918 approximated $15,000,000,000.

Another estimate of the relative shares of labor, capital, and management in the national income has been made by the Federal Trade Commission in a bulletin on the "Chief Sources of National Income"; of the total estimated product of industry, amounting to practically $70,000,000,000, for 1923, the employed personnel of all industries and occupations received $38,200,000,000 or 55 per cent in salaries, wages and other remunerations for their work; capital and enterprise received the other 45 per cent in profits, rents, and interest.

The bulk of the large increase in income during the war was due to the rise in prices. The actual growth of the national income is seen better when the figures are reduced to prewar purchasing power and express the value of the incomes of succeeding years in terms of the price level of 1913.

	National income, billions	Per capita income, dollars
1913	$34.4	$354
1914	33.0	333
1915	35.2	350
1916	40.7	400
1917	40.8	396
1918	38.8	372
1919	36.9	352
1920	35.3	332
1921	49.0	452

A comparison made with other nations shows that the United States leads the world in both the size of its national income and the per capita income of its people. In 1914, the figures for the leading nations were as follows:

Country	Source of estimates	National income, millions of dollars	Per capita income, dollars	Grade of accuracy
United States	National Bureau of Economic Research	$33,200	$335	I
United Kingdom	Bowley, Stamp	10,950	243	I
Germany	Helfferich	10,460	146	I
France	Pupin	7,300	185	II
Italy		3,890	112	IV
Japan		1,580	29	III

Grade I signifies estimate not likely to be inaccurate to a greater extent than 10 per cent.
Grade II signifies estimate not likely to be inaccurate to a greater extent than 20 per cent.
Grade III signifies estimate not likely to be inaccurate to a greater extent than 30 per cent.
Grade IV signifies estimate not likely to be inaccurate to a greater extent than 40 per cent.

The term "distribution" suggests an arbitrary division of the proceeds of industry, and such a course is conceivable. Under a system of Socialism, both the production and distribution of wealth might be directed by the state, with the shares of the different producers apportioned according to the dictates of the government. In the opinion of some, this would result in a more equitable distribution of the nation's wealth among those who have helped to produce it. Various theories of distribution have been put forth, purporting to explain either existing conditions or ideal states, but in the world as it is, the distribution of wealth, though modified by law or custom, by individual preference or organized interests, is determined by the laws of value. These laws never cease to act, and in modern society all economic remunerations are governed by them.

Each individual receives his share of the net product of the nation's industry in the form of rent, wages, interest, or profits. Any one individual's income may consist of one or more of these. They are, in effect, prices paid to their respective owners for the use of the factors of production. The extent of any one individual's income will depend on the exchange value of the services which he renders to production as landowner, laborer, capitalist, or entrepreneur. The value of any factor of production, whether it be a piece of land, the services of a clerk, or those of a machine,

is governed by the law of supply and demand, as is the value of a consumption good. This great law is the key that unlocks the problem of the distribution of wealth. A complete explanation of the division of wealth among the individual members of society will involve an investigation into the conditions of supply and demand for each of the factors of production. First, however, we will stop to notice a new principle influencing the demand for the factors of production.

PRODUCTIVITY OR THE VALUE OF A FACTOR OF PRODUCTION IN RELATION TO THE JOINT PRODUCT

Although the demand for land, labor, and capital is derived ultimately from the valuable commodities which are produced by means of them, it proceeds directly from the entrepreneurs, who coordinate these other factors in productive enterprises. By virtue of their ownership and control of business organizations, this class becomes the employer of the other classes. What considerations, then, govern their demand?

The desire of a consumer for a consumption good is based on the satisfaction of a personal want. But a business man desires a piece of land, a machine, or the services of a laborer for the purpose of making a commodity or service for sale at a profit. Hence, while the value of a consumption good to a customer depends on the intensity of the desire which it satisfies, that of a production good to a business man depends on the extent to which it aids him in the making of his product, or, as it is usually termed, its "productivity." The question then arises as to how the concern is able to tell just how productive any particular unit is. The product is the joint product of a number of widely different units—machines, money, men, etc. Is it possible to determine definitely what part of a joint result is due to any given unit?

The only practical method of measuring the contribution of any given unit to a joint result is to find out how much that result is increased by its presence or decreased by its absence. The variation in the joint product is, of course, the resultant of all the cooperating units, but as it depends on the presence or absence of the particular unit being added when it is present

and missing when it is absent, in a real sense it is due to that unit and may be said to measure its productivity. As the primary purpose of every business is to make a profit, the value of the aid rendered by any particular member will hinge on the extent to which it reduces the joint costs or increases the value of the joint product, or both. A purchasing agent, for example, may be valuable not only because he facilitates production by having the proper quantity and quality of materials on hand at the proper time but also because of the amount which he saves by watching market conditions and purchasing at the lowest figure. A plant manager may increase the volume of production or decrease the unit cost, or both. In many cases, of course, the work of individual units is so indirect and far removed from the finished product that their contribution to the general result must always remain a matter of estimate. But whether a matter of estimate or exact measurement, it is this contribution to the general result that is the basis of the evaluation of any given productive unit to a business concern.

This is the principle determining the demand of the individual employer. The highest price which he will be willing to pay will be governed by the additional value added to his product over and above the extra cost. In the case of a machine, allowance would have to be made for maintenance, repairs, and interest on the capital if the purchase money is to be borrowed. The increase in the value of the total product after deducting these extra costs would mark the outside limit of the demand price. Just as the consumer balances the money cost with the satisfaction which he expects to derive from the use of the article, so does the entrepreneur weigh the cost of the productive factor with the value which it will add to his product. And this added value marks the outside limit of his demand price.

The Law of Diminishing Productivity.

When a number of similar units of any factor of production are successively added to a business enterprise, the additions made to the product, even though they may increase at first, finally grow smaller as the supply of units is increased. This is a general law that holds true of any joint result obtained by the combination of a number of different factors, when the

amount of those factors may be varied. By keeping all but one fixed and varying the quantities of that one, the resultant variations in the joint product will finally begin to diminish. We have already referred to one phase of this law under the name of the law of "diminishing returns." In that case, the fixed factor was land, while labor and capital were massed as the variable. The law operates just as surely when labor and capital are fixed and the quantity of land is varied. And though it applies to all kinds of business organizations, perhaps its operation has been laid bare in the business of farming as much as anywhere, owing to the numerous experiments that have been conducted to ascertain more exactly the value of labor or fertilizers to crops. In these experiments, all of the factors acting on the crop are kept constant but one, and the variations due to this one are accurately measured. Take, for example, the following experiment carried on at the famous Rothamsted Experimental Farm in England to determine the value of nitrogen to the growing of wheat:

Plot	Manures per acre	Product per acre, bushels	Increase for each additional 43 pounds nitrogen, bushels
A	Minerals alone	18.3	
B	Plus 43 pounds nitrogen	28.6	10.3
C	Plus 86 pounds nitrogen	37.1	8.5
D	Plus 129 pounds nitrogen	39.0	1.9
E	Plus 172 pounds nitrogen	39.5	0.5

The fourth column shows the number of bushels of wheat added to the joint product by each additional dose of nitrogen and gives unmistakable evidence of the operation of the law of diminishing productivity in the successively smaller additions made to the joint product. Other experiments in intensive cultivation, extra ploughing, harrowing, etc., show that additional units of labor and capital fall under the same law.

Such experiments enable the farmer to make a more economical

combination of his factors of production, to judge better the relative amounts of each which it is best to use. In increasing his crops, he is guided in deciding whether to rent more land or cultivate intensively by applying more fertilizers or hiring more labor. The effect on the farmer's demand is readily seen. The practical effect of all these experiments is to show more exactly the value of different quantities of fertilizer, of capital, or of labor or the precise quantity of any one that it is profitable to use.

Marginal Productivity and Individual Demand.

The demand of a producer for a number of similar units of a factor of production is governed by marginal productivity in the same manner as that of a consumer is by marginal utility. Suppose that the following table contains the result of an experiment carried out on a farm of 100 acres. What would determine the highest price which the farmer would pay per unit for any given quantity which he would purchase at any given price?

Acre	Fertilizer units	Total product	Increase for each additional unit	Value at $1 per bushel	Increase at $1.50 per bushel
A.....	..	11			
B.....	1	19	8	$8	$12 00
C.....	2	29	10	10	15.00
D.....	3	38	9	9	13.50
E.....	4	44	6	6	9.00
F.....	5	49	4	4	6.00

The value of fertilizer to a farmer depends on the value which it adds to his crops. But the value added depends on the quantity used, each added unit resulting in a smaller increase of product. Column 5 gives the value of the increase for each additional unit of fertilizer when wheat is selling at $1 a bushel. The larger the quantity he purchases the less he will pay for each unit. He would not be willing to give, for instance, more than $9 per unit for a supply of three units. Were the price

any higher, it would not pay him to use three, as the third unit adds only $9 to his crop. He would use only two; to induce him to purchase three, the price must be $9 or lower. To tempt him to invest in four units, the price must be $6 or less, as the fourth adds but $6 to the value of his crop. The outside price he would pay for a supply of four units would be $6; or, for three units, $9. In each case, the price which he would pay per unit is determined by the value added to the crop by the least productive unit of the quantity.

Or if we assume the price to be fixed, as it is, of course, in the case of fertilizer or other capital goods, we see that the quantity which he would purchase is likewise determined by a comparison of the cost with the value added to his product by the marginal unit. If fertilizer is $6 a unit, he will not hesitate to apply three per acre. He would break even on the fourth. The outside limit of his demand would be four, and it would be decided by his comparing the value added by the fourth unit to the price. Just as in the case of the consumer, it is the least productive unit that signals the buyer to stop.

Should the price of wheat go up to $1.50, the productivity and, hence, the value of fertilizer will also be increased. Though each unit does not add more bushels, it does add more value to the total product. The farmer could now afford to pay a higher price for four units or use a larger quantity at the old price of $6.

Marginal Productivity and Total Demand.

The total demand for any particular kind of production good or service is the sum of the individual demands for it and depends on marginal productivity. Suppose that four farmers, A, B, C, and D, find that consecutive units of labor or capital make the following increases to the total values of their crops:

	A	B	C	D
First	$ 8	$7	$6	$8
Second	10	9	8	7
Third	9	8	6	5
Fourth	6	5	4	3

If the unit price of the productive factor were $5, A would take four, B's outside limit would be four, C would employ but three, and the largest quantity D could be induced to hire would be three, making a total demand for fourteen units. This is the largest quantity that would be bought at that price and, also, the highest price at which the whole supply of fourteen would be disposed of. At any higher price, B and C would refuse to purchase their last units. They are the buyers of the margin whose purchase is necessary to clear the whole supply, and the marginal productivity of the productive factor to them determines the highest price at which the supply would be purchased *in toto.*

Practical Importance of Marginal Productivity.

In order to make clear the operation of the law of diminishing productivity and the principle of marginal productivity, we have assumed an exactness which is not everywhere found in actual affairs. But while it is not always possible to segregate a single kind of production good or service and measure the resultant variations in the joint product, wherever this is feasible this law is seen to be in operation, and the principle of marginal productivity will be found to govern demand. Every business concern seeks the most economical combination of its productive units. In so doing, it will employ each particular class up to that point where the increase in product due to the last unit just covers the additional cost. In everyday practice, business concerns are constantly comparing the relative values of different kinds of productive factors, deciding on the advisability of more machines or more men or whether or not it would not be better to install a particular kind of machine or hire a particular man or fire him. The actual form in which this principle is applied by them is in buying or hiring one or more or one less units of land, labor, or capital. The practical question is, Will it pay? And this depends on what will be gained or lost by one more or one less unit, which unit is the marginal unit.

The entrepeneur class is the direct source of the demand for the factors of production and the judge of the value of their services. This judgment may be based on exact figures, or it may be a matter of opinion. Modern cost and efficiency systems,

personnel work, psychological analyses of the man and the job are all helping to determine more exactly the value of the individual unit to the concern, but there is still lamentable ignorance in this respect. But whether it is a matter of estimate or capable of exact measurement, the only practical test for the value of any unit of a factor of production to industry is what is added to the sum total of wealth by its presence or lost by its absence. This is a truth that has many practical applications to everyday business life.

Marginal Productivity and the Law of Supply and Demand.

It is sometimes said that the value of a factor of production is determined by its productivity. This is an exaggeration somewhat akin to the cost theory or the utility theory, each of which seeks to explain value from one side only—to exalt one of the two primary causes at the expense of the other. The two fundamental causes of value are scarcity and utility. In the case of the products of industry, cost enters as a secondary cause governing scarcity. We also find in the case of the factors of production a secondary cause, productivity, which determines their utility to the entrepreneur, and, through that, their value to him. One set of causes acts on the supply side, the other on the demand side, and the market value is determined not by either one but by *the interaction of both.* In this chapter, we have been examining the action of one cause operating on the demand side. But to prevent undue emphasis, we must not forget the other side of the equation. The exchange values of the factors of production—rent, wages, interest, and profits—are governed just as much by scarcity and cost as by utility and productivity. These, acting through the law of supply and demand, codetermine the prices of all production goods and services under conditions of free competition.

Summary.

By "distribution" is meant the division of the "national income" among the agents of production by whose cooperation it is produced. The United States leads the world in both the size of its national income and the per capita income of its people. The most reliable estimates of the national income of the United

States and its distribution among different classes are those prepared by the National Bureau of Economic Research. The figures of the bureau indicate that during the period covered by their investigation a little more than half of the national income went as wages to the workers and the balance as rent, interest, and profits to the owners of property. In its analysis of the distribution of income among individuals, the bureau estimates that in 1910 only one in twenty-five of those gainfully employed enjoyed incomes exceeding $2,000 a year; of all those engaged in gainful occupation in 1918, 86 per cent earned less than $2,000.

The national income is distributed in the form of rent, wages, interest, and profits. These represent the prices paid for the use of the four factors of production. The extent of any individual's income will depend on the exchange value of the services which he renders to production, as landowner, laborer, capitalist, or entrepeneur. The value of any factor of production is determined by the operation of the law of supply and demand. A complete explanation of the division of the national income will involve an investigation into the conditions of supply and demand that determine the value of each of the factors of production.

The entrepeneur class is the direct source of the demand for the factors of production, and the value of any productive unit depends on the contribution which it makes to the joint product of a business enterprise. As the primary purpose of every business is to make a profit, the value of the aid rendered by any productive unit will hinge on the extent to which it reduces the joint costs or increases the value of the product, or both. The highest price which the employer will be willing to pay for a given unit of a productive factor will depend on his estimate of the additional value added to his product over the additional cost. When a number of similar units are employed in a productive enterprise, their value will be determined by their marginal productivity. The values of the factors of production are governed by scarcity and cost as well as by utility and productivity.

Test Questions

1. What law governs the share of wealth received by each factor of production under our economic system?
2. What principle determines the demand of the employer for any factor of production?
3. Give an illustration of the law of diminishing productivity.
4. What is meant by "marginal productivity"?
5. To what does the equilibrium price of a factor of production tend to correspond?

References

CARVER, T. N., "Principles of Political Economy," Chap. XXX; "Distribution of Wealth," Chap. II.
CLAY, H., "Economics for the General Reader," Chaps. XII, XXI–XXV.
COMMONS, J. R., "The Distribution of Wealth," Chap. III.
DAVENPORT, H. J., "Economics of Enterprise," Chaps. IX, X, XXIII.
ELY, R. T., "Outlines of Economics," Chap. XIX.
GIDE, C., "Political Economy," Book IV.
KING, W. I., "Wealth and Income of the People of the United States."
MARSHALL, A., "Principles of Economics," Book VI, Chaps. I, II, XI.
NICHOLSON, J S., "Principles of Political Economy," Book II, Chap. I.
RYAN, J. A., "Distributive Justice."
SELIGMAN, E. R. A., "Principles of Economics," Book III, Chap. XXIII.
SMART, W., "Distribution of Income."
TAUSSIG, F. W., "Principles of Economics," Chaps. XXXVIII, LIV.

CHAPTER XXV

RENT

Economic Rent.

By "rent" is meant in economics that share of the net product of industry assigned to owners of land or natural resources for the part which these play in production. In ordinary parlance, rent stands not only for the use of land but also for the capital invested in it. The rent of a farm or store includes a return for the use of buildings and improvements as well as the land. This usage, like all popular terminology, has a very practical basis. For capital invested in land becomes more or less merged with the land itself and tends to have its value determined in much the same manner as that of land, indeed, once capital is applied to land in the form of improvements, their values become so fused, especially after a period of time has elapsed, that it is scarcely possible to differentiate between them —to tell, for instance, what part of the product of a well-cared-for farm is due to ditching, draining, fertilizing, etc., and what to the original soil. For the purpose of economic theory, there are good reasons for distinguishing between the two kinds of income, as, indeed, there often are in business, where the term "ground rent" is used to differentiate the payment made for the use of the site. The dual return popularly called "rent" is referred to in economics as "commercial rent." A knowledge of the operation of the law of demand and supply in determining the value of land is essential if we wish to understand how the values of commercial rents are determined in everyday life.

Demand for Land Based on Surplus Productivity.

Land is in demand as a factor of production because by its use a product is able to be produced at a profit. The use of land involves a cost; unless the value of the product exceeds this

cost, it is evident that no one will be willing to pay for the privilege of working the land. The part that nature plays in production is to furnish the raw materials, but even though she furnishes these free of charge, the use of them in production involves a cost. To go back to the naked facts of existence, man depends for the wherewithal to live on the products he obtains by his labor on the soil. No matter who owns the soil, he cannot exact a share of the joint product of his land and another's labor if that joint product is insufficient to support the laborer. Even slaves must be fed, and no matter what system of distribution prevails, the land must first provide subsistence for the laborer or he ceases to exist. The laborer, thus, has a preferred claim on the product by virtue of the laws of nature. This is, however, getting down to the very bone of existence. In civilized countries, man is not satisfied with a bare bone existence. With the aid of science, capital, and organization, he has tremendously increased the productivity of his labor, and in return for the effort and sacrifice involved he demands a decent living. He must at least receive this or he will not work. This constitutes his supply price, based on his costs, which must be received out of the price of the product to maintain an adequate supply of his labor. Whatever is paid to the owner of the land must be over and above this minimum necessary to maintain labor. Now, this is looking at production as if it comprised only two factors, and at bottom it does. All wealth is produced by man and nature. The other two factors are the result of man's effort and sacrifice and, therefore, involve cost. Labor, capital, and organization each has its supply price, which must be paid to call into being an adequate supply. Each of these factors, then, has a preferred claim on the joint product, which, in the long run, must be paid or its supply diminishes. Land having no cost has no supply price, no minimum on which its supply depends. Viewed in this fundamental light, the productivity of land is in the nature of a surplus; the share of the product imputable to land is that which remains after a portion equivalent to the costs of the other factors has been taken from the total product. Hence, the demand price for land is the difference between the price of the joint product and the supply prices of the other factors.

Now, it is obvious that land varies in productivity. In the United States at the present time, there is some land so sterile that it does not repay cultivation, some that just repays working, and other that brings in a rich return. Land that just repays the cost of working it is said to be on the margin of cultivation and is called "no-rent land." Now, it is at the margin of production that the supply prices of the other factors of production are set. Here the price of the produce just equals the costs of the producers. As a greater product is able to be raised by the same producers for the same outlay on better land, these superior lands yield a surplus over cost, a surplus which the owner of the land is able to exact as rent. The highest price that will be paid for the use of any given piece of land is the difference between what a given quantity of the productive factors is able to produce on it and what the same factors are able to procure on marginal land.

Causes of Productivity.

The two chief causes of differences in the productivity of land are fertility and location. Fertility, of course, is used in its broadest sense to include not only the quality of the soil but also the advantages of climate. The rich, alluvial soils of the Mississippi Valley, the light tobacco loams of Lancaster County, Pa., yield a richer product and command a higher rent than less favored lands. The kind of crop or the character of its minerals has a similar influence on value of land. Location is as important as fertility but in a different way. Fertility increases the gross product; location, as far as agricultural land is concerned, decreases the cost of operation. Good roads, proximity to markets, rail or water transportation are all important factors in farming. Of two 100-acre farms yielding twenty bushels to the acre, if it costs 5 cents a bushel to take the product of one to the market and 10 cents to take that of the other, the location of the former will be worth $100 to the owner.

The values of farms, mines, and timber lands are all affected by location, but it is over factory and store sites that it exerts its peculiar powers. In the case of factory sites, the suitability of the land for building and the quality of the water are con-

siderations, but the chief factors are accessibility of (1) raw materials; (2) markets; (3) sources of power; (4) labor supply; (5) loanable capital. In deciding on the location of their plants, business concerns consider carefully these factors: the proper combination gives them a big advantage over less favorably situated concerns; the lack of any one, if competition becomes keen, may spell ruin. Because certain districts possess the most effective combination of these for particular trades, huge industrial centers spring up, and land becomes exceedingly valuable. Pittsburgh became the center of the steel industry on account of its proximity to raw materials and fuel and, also, its strategic position between the markets of the East and West. Nearby, in the Connellsville Valley, lies the finest bed of coking coal in the world. From deep down in the bowels of its surrounding hills, nature has furnished it until very recently lavish supplies of natural gas, the purest of fuels. Its ore it no longer obtains from the Alleghenies but from the Lake Superior region, which today is the chief source of supply for the whole country. Cheap water- and good rail-transport facilities still enable Pittsburgh to secure the ore for its hungry blast furnaces at reasonable rates. The influence of raw materials on location is seen in the erection by the United States Steel Corporation of their mammoth plant at Gary, where by virtue of its position on the lake front it secures its ore supplies by water from the nearby ore fields and its coal and coke, also, by cheap water haul after they have been brought by rail to Lake Erie ports. Proximity to cheap power, which means lower cost, has increased the value of land about Niagara Falls and made that famous natural sight the center of a thriving manufacturing community.

But it is in store and city sites that we see the supreme importance of location. Here the influence of fertility is nil, while that of location is absolute. Which neighborhood, which street, even which side of a street a store locates on sometimes means the difference between success and failure. Crowds have their peculiarities, their favorite corners and walks; crowds mean sales, and on sales stores live. Fabulous rents are paid for particularly choice positions; a busy corner may command several thousand dollars a year more than the same amount of space in the middle of the block. Car stops and other points of van-

tage are eagerly bid for. The pure productivity of space on crowded city thoroughfares has only recently been realized in this country. One of the most interesting signs of this is the tiny storelet with its few feet of window space and the interior just big enough for the owner to stand behind the counter and a customer in front. The amount of money that filters into these diminutive stores and others bordering city streets from the stream of human life ceaselessly flowing by makes the gold deposited in the beds of Alaskan rivers pale by comparison. Big rents are paid to secure big volume of sales; a big volume of sales means lower cost; lower cost means bigger profit. The unit margin of profit may be small, but the total profit considerable. One of the most important causes of lower costs and bigger profits is quicker turnover. This is one advantage of the Tiny Tim type of store mentioned above, which turns its capital over much more quickly than the average. The rapid turnover of some of the big chains, such as the American Cigar Stores Company, has opened the eyes of retail merchants as to the possibilities in this direction; and this, combined with the educational work done by some of the big wholesalers, such as Armour & Company, is enabling even the small retailer to grasp the advantage of bigger volume and quicker turnover.

Location sometimes means prestige. Fashionable thoroughfares like Fifth Avenue, New York, or Bond Street, London, furnish an exclusive trade. Often the same hat will fetch a higher price in an exclusive establishment on Fifth Avenue than in the common garden variety of store on Sixth Avenue. As a general rule, though, higher rents do not mean higher prices. The small retailer in a back street who claims to sell at a lower price because he pays a lower rent or does not advertise is usually mistaken. Store sites in busy places act in the same manner as advertising to reduce costs by increasing sales. The attractive store site, like rich farm land, brings an advantage to its user over less favored situations; competition among storekeepers for the superior sites enables the owners to exact the difference or part of it as rent. Rent thus appears as a gain to the owner of the property, due to its superiority over less fortunately situated locations, and the rent paid tends to equalize the advantages of different sites to the users. We say "tends," because,

as a general rule, the better sites yield more in proportion to the rent paid. Not all the superior productivity is absorbed by the landlord in every case, though this is the tendency.

Unique Conditions of Supply.

But rent is influenced just as much by scarcity as by productivity. No matter how productive land is, if there is a superabundance of it, no rent would be paid for its use. Among the four factors of production, land is unique in the fact that the absolute supply of it is limited by nature. Each of the other factors is capable of increase and normally does increase, but the surface of the earth is eternally fixed. The population of a country tends to grow, but its extent of the earth's surface is fixed by its geographical boundaries.

But even this evident truism needs to be modified, for while the absolute supply of land within a nation may be fixed, the available supply at any given time is capable of increase. Transportation is the boon by means of which the country has been able to open up new supplies of reserve lands. All during the nineteenth century, as the railroads reached out across this vast continent, new lands and resources were continually being opened up. Trolley systems and interurban electrics are doing the same thing for the cities today, bringing new land into use or old land into more productive use, as they radiate from the dense centers of populated cities into the open country. But though this should be borne in mind in discussing the nature of rent, on account of its very practical bearing on land values, the unique character of the supply of land in reference to its absolute limitation by nature should also be clearly grasped, as it exercises, in the long run, considerable influence on the distribution of national income.

The fact already referred to that land has no supply price based on cost is of vital importance to the nation at large. The productive powers of the other agents are stimulated or retarded by the payments which they receive, it being generally true that any increase in the marginal rates of wages, interest, or profits tends to increase the activity and supply of their respective factors, while any decrease lessens them. The fact that the supply of land is independent of the price paid to its owners,

being neither increased by an increase in rent nor decreased by a lowering of the payments received by landowners, is one of the foundation stones of Henry George's famous "single tax" and has an important bearing on taxation.

Nature of Rent Illustrated.

How rent arises and its nature as a surplus above the returns to the other factors at the margin of production may be

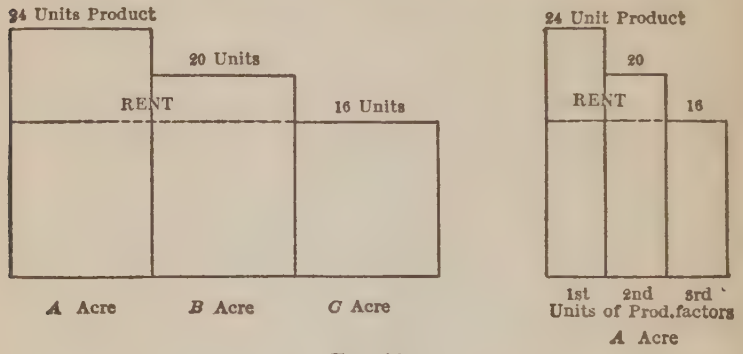


FIG. 18.

illustrated by assuming that in a given community there are three grades of land which, when cultivated with a given quantity of the other factors, yield 24, 20, and 16 units of product, respectively. In the diagram (Fig. 18), the lines *A*, *B*, and *C* represent acres of the three grades, and the rectangles the returns which they make to the same investment.

In pioneer days, there would be land for everybody and to spare, so that even the best land could be had free. Those Arcadian times soon pass, the most desirable ground becomes occupied, and newcomers are forced upon inferior land. Those who own and cultivate their own land on grade *A* now obtain 4 units per acre more than those producing on *B* land for the same investment. Those who cultivate *A* lands as tenants will be willing to pay up to 4 units of product as rent. They have the alternative of going onto free land at *B*, which produces but 20 units. By staying where they are and paying 4 units as rent, they get a return of 20 units for their investment. The owners of grade *A* will not be able to raise the rent above 4

units, or tenants will move to free land. If they charge any less than 4 units, their tenants would be receiving a return over and above what could be obtained on free land; competition for the use of *A* land would then raise the rent. There will be a tendency for the rent to be fixed at 4 units of product, which is the difference between what the given factors of production could earn at the margin of production on free land and what they could produce on superior land *A*.

As there is more land of grade *B* than is required, no rent would be paid, but with the growth of the community, land at *B* would finally be occupied and land at *C* would come into use. Owners of *A* lands would now be able to exact 8 units from their tenants, and owners of *B* 4 units, which, in each case, is the excess product which the same factors of production could obtain by use of the superior land over what they could earn at the margin on *C* land. In the course of time, as the community develops and more and more land is brought into use, the tendency will be for the margin of production to be lowered and rents to be raised. Under actual conditions, the process, of course, will not be so evenly graded; part of the new lands made available may be more productive than some in use formerly, as was the case last century in the states when transportation transferred the margin of cultivation from the rocky New England states to the broad, rich lands of the Middle West. The development of agricultural science and machinery may also tend to counteract the fall in the margin. The preceding account, however, illustrates the trend of events in relation to land over long periods of time.

In the above illustration, we have assumed that as the community developed, the expanding population would be employed and fed by opening up new land and that each grade of land would be cultivated with equal intensiveness. This, of course, would not be the case. As the industries of the country grew, the increasing supplies of labor and capital would be applied more intensively to the better grades, and the extra product would be obtained by intensive as well as extensive cultivation. These two processes would proceed side by side and would both result in a higher cost per unit of product or a lower return to equal units of labor and capital.

Suppose that by applying a second unit of productive factors on *A* land, that is, by doubling the investment, the total production is increased by 20 units. It would then be immaterial, as far as the return in product is concerned, whether the extra productive factors were employed intensively on *A* or extensively on *B*. If we assume that a third unit applied to *A* would still further increase the product by 16 units, it is evident that it would not pay to cultivate *A* so intensively as this while free land at *B* yields a return of 20 units. At a later period, however, when the community is forced to have recourse to inferior land at *C*, which yields only 16 units, it will pay to cultivate *A* more intensively by applying a third unit. Figure 18 represents *A* so cultivated. The return to the marginal dose of labor and capital on *A* is 16 units, the same yielded at the extensive margin on *C* land. Intensive and extensive cultivation will thus proceed simultaneously, and the tendency will be for each grade of land to be cultivated to that point where the returns to the marginal dose of the productive factors employed on it correspond with that which the same factor would produce on marginal land.

The rent for an acre of *A* land will tend to correspond to the surplus product which the productive factors employed on it produce over and above the return which they obtain at the margin on *C* land. The producers have the alternative of going on to free land at *C* or cultivating *B* land more intensively; in either case, they would net 16 units of product each, or 48 in all. The owner of *A* land will be able to secure as rent the surplus due to the superiority of his land. In Fig. 18, the area above the dotted line measures the rent of an acre of *A* land under intensive cultivation. In both cases, the rent is the surplus product over and above that which the productive factors earn at the margin of cultivation, and as it is at the margin that the normal returns to the factors are set, rent appears as the surplus product over and above the normal rates of the other factors.

We have assumed that the normal returns to the other factors of production are determined at the extensive margin of cultivation by the return which they obtain on free land. We could as easily have measured them from the intensive margin by

the return to the last or least productive unit employed. In the old countries there is little, if any, free land, and for many purposes in the states the land at the margin, the poorest land in use for the particular purpose, is not free land but commands a rent. Rent would arise, however, and would still be a surplus over and above the normal returns to the factors employed, if there were only one kind of land, provided that were scarce. As the demand for the product of the land grew, it would be obtained by more intensive cultivation. More and more labor and capital would be massed on the land. The price of the product would be determined by the cost of the most expensive portion, that raised, in this case, at the intensive margin. This price must remunerate the labor and capital employed at the margin and represents the normal rate of return to these factors. Those units employed above the margin produce a bigger product, which, as it is sold at the same price, affords a surplus over its cost. This surplus over and above the normal rates to the factors employed on the land would go to the owners as rent. As more and more product was required, it would be obtained by a more intensive cultivation of the land. The margin of cultivation would be lowered and rents raised. The price of the extra product would be raised or the standard of living of the workers lowered.

The Tendency for the Value of Land to Rise in the Long Run.

The fact that land is distinguished from its partners in production in that it does not possess a supply price based on cost gives those partners a preferred claim on the joint product. The equilibrium prices of the other factors can never sink permanently below their costs, which acts as minimum, while those of land may fall to zero. But this is looking at only one side of a fact. A supply price based on cost is like a double-edged sword in the hands of the law of value; it cuts in two directions. It may sever the price of land altogether, should the joint product be insufficient to satisfy the minimum claims of the other factors, but it just as surely shears their prices off when they rise above their respective costs. Just as in the case of a commodity, a price much above cost acts as a stimulus on the supply, the increased supply lowers the price; so that in the long run the

equilibrium price tends to correspond with its cost of production. The same tendency is true for wages, interest, and profits. Thus, if the earnings of any class of labor rise above normal, a compensatory action increases the supply of that kind of labor, and wages will fall, just as profits above the ordinary in any particular line of business after a while disappear for the same reason. The dynamic connection between the earnings of labor, capital, and organization and their supplies acts as an automatic check on their rise. But for rent there is no such check; high rents do not increase the supply of land and establish a new and lower equilibrium price. There is no limit to the share of the joint product that may go to land except the minimum that must be paid to the other factors. And the conditions are such that, in the long run, the tendency is for land to exact a larger relative share, to press down on the minima of the other factors, and exact an evergrowing surplus for its owners.

The situation may be summed up as follows: The price of each of the four factors of production is determined by the relation between the supply of it and the demand for it. The supply of land is limited; that of each of the others tends to increase. The increase in the supplies of the others means an increase in the demand for land. In the course of time, land thus becomes relatively scarce and its value inevitably tends to rise. This, like all general statements, needs to be qualified. The available supply of land may be subject to increase. Over short periods, the supplies of the other factors may also be incapable of increase. Competition is not perfectly free. Science and invention may delay this tendency, but in due course of time, as the history of the older nations shows, it inevitably asserts itself. The margin of production tends to fall, and the returns to the other factors to be lowered, while the surplus going to the owners of land tends to increase; a larger proportionate share of the national income thus flows into the pockets of the landlords; land values rise.

The Ethics of Rent.

This brings us to the ethical aspect of the rent question. The owners of land have been accused of reaping where they have not sown, and rent has been described as a parasite form of

income, in that it is due to the labor of others and not to any productive effort on the part of those who receive it. In the strictest theoretical sense, this may be true. Economic rent is the return paid for the land; the income from improvements to the land by the owner is classed as interest. All wealth is the result of the application of man's productive efforts to land. To labor, to create and save capital, to organize enterprises involves effort and sacrifice. Wages, interest, and profits are payments made in return for productive effort or sacrifice on the part of those who receive them. The landlord receives a return for the productivity of his land, not for any productive effort on his own part, except it be that of collecting the rent. It is true that rent, from the viewpoint of society, is a surplus over and above the cost of production paid to the owners of land. But so long as a country allows private ownership of land, those who own the land have a right to exact a rent for their land from those who wish to use it also for the purposes of private profit. It is also true that the majority of those who own land have paid for it with money they have earned by their own productive effort; and that each of the other individual producers has been paid for the part he has played. If land were nationalized, rent would still exist, only it would be paid to the nation. It has been suggested that private property in land should be abolished. But while it might be a wise and just plan for a new community to retain possession of the land, rent it, and use that rent for the common good, it would plainly be unjust as well as unwise to confiscate the real estate of an old country or the income from it, which, in most cases, represents a return on an investment made by the owner, similar to an investment of capital.

The most practical question relating to land has to do with the increase in land values due to the tendency for rents to increase as a country develops. This increased valuation was termed by John Stuart Mill the "unearned increment," and has ever since gone by that descriptive title. The value of a piece of real estate depends on the income it will bring to its owner, and its selling value is found by capitalizing the rent that may be obtained for it at the current rate of interest. The value of real estate increases with the rise in rents. Rents rise

as the productivity of the land increases. The increase in land values that inevitably occurs as a country develops is due not to the owners of the land but to the general progress of society. City lots, especially, owe their high rents and values to social causes, to the growth of cities, the development of trade and transportation, and the activities of the community as a whole. Manhattan Island was purchased from the Indians by Peter Minuit for the Dutch in 1626 for 60 guilders, about $24, or $100 in modern value worth of pots, pans, axeheads, blankets, and beads. Lots purchased by John Jacob Astor a hundred years ago on the same island for a few thousand dollars are today worth millions. As an alternative to the nationalization of the land, it has been proposed that the increase in land values not due to the exertions of the proprietors but to the progress of society should be secured by taxation. One of the many difficulties in the execution of this plan is that the values of land and improvements are so intertwined that it is exceedingly hard to distinguish between them. The question of taxation requires separate treatment beyond the scope of present space; enough has been said to show the close practical relation that exists between the nature of rent and taxation.

Summary.

Economic rent is the share of the net product of industry assigned to the owners of land or natural resources for the part which these play in production. Rent is a surplus form of income due to the superior productivity of better lands over land at the margin of production where the product is equal only to the cost. As a greater product is able to be raised for the same outlay on better land, these superior lands yield a surplus over cost, a surplus which the owner is able to exact as rent. The rent for any given piece of land will tend to be equal to the difference between what a given quantity of the productive factors is able to produce on it and what the same factors are able to produce on land at the margin of cultivation.

The two chief causes of differences in productivity of land are fertility and location. Lands differ in value because of the richness of the soil, the character of crops grown on them, and the kind of minerals contained in them. Location greatly affects

land values. The values of farms, mines, forests, and factory sites are all influenced by their location in respect to transportation facilities, markets, sources of power, labor supply, or raw materials. Location is particularly important in determining the value of store sites.

The value of land is influenced just as much by its scarcity of supply as by its productivity. Among the factors of production land is unique in that its supply is limited by nature. The population of a country tends to grow, but its land area is fixed by geographical boundaries. For this reason, land values in a country tend to rise and rents to increase. Because the increase in land values that occurs as a country develops is not due to the owners so much as to the general progress of society, rent has been referred to as an "unearned increment," and various plans have been proposed by means of which it could be secured for the benefit of society at large.

Test Questions

1. Explain the difference between "economic" and "commercial" rent.
2. In what sense is rent a surplus form of income?
3. What are the two chief causes of the productivity of agricultural land?
4. What factors govern the location of factory sites?
5. How does location influence the value of store sites?
6. How does the supply of land differ from that of the other factors of production?
7. Why as a country grows will land values tend to increase?
8. Is it right to say that ordinary "commercial rent" is unearned?

References

BUTTERWORTH, H. L., "The Farmer and the New Day."
CARVER, T. N., "Principles of Economics," Chap. XXXIV.
CLAY, H., "Economics for the General Reader," Chaps. XIX, XX.
ELY, R. T., "Outline of Economics," Chap. XX.
GEORGE, H., "Progress and Poverty."
GIDE, C., "Political Economy," Book IV, Part II, Chap. III.
HURD, R. M., "The Principles of City Land Values."
JEVONS, W. S., "Theory of Political Economy," Chap. VI.
JOHNSON, A. S., "Rent in Modern Economic Theory."
MARSHALL, A., "Principles of Economics," Book VI, Chaps. IX, X.

NICHOLSON, J. S., "Political Economy," Book II, Chap. XIV.
PANTALEONI, M., "Pure Economics," Part III, Chap. IV.
PIERSON, M. G., "Principles of Economics," Vol. II, Chap. V.
RICARDO, D., "Political Economy."
SEAGER, H. R., "Principles of Economics," Chap. XIV.
SELIGMAN, E. R. A., "Principles of Economics," Chap. XXIV.
SMITH, A., "Wealth of Nations," Book I, Chap. XI.
TAUSSIG, F. W., "Principles of Economics," Chaps. XLII–XLIV.
WALKER, F. A., "Land and Its Rent."

CHAPTER XXVI

WAGES—FACTORS ON THE DEMAND SIDE

Peculiar Importance.

The share of the joint product of industry assigned to men for their labor is known as "wages." The term "labor" includes all mental and manual power expended in the satisfaction of economic wants, from ditch digging to managing a billion-dollar corporation. All remunerations for personal services such as salaries or fees are included under the head of wages. When men are in business for themselves, the share of the joint product assignable to their own labor, strictly speaking, may be more or less merged with the other shares, rent, interest, or profit. Many farmers and small tradesmen do not clearly differentiate among profits, interest, and wages.

Yet in a vital sense, wages differ from rent, interest, and profits in that the latter are derived from productive property, but the source of the former is man himself. Wages are paid for the personal services of human beings, whereas rent and interest are paid for the use of land and capital. It is true that what is paid for in each case is productive power, but the crucial fact is that in the case of land, capital, and organization, the owners and the productive powers of their respective factors are separable but the laborer and his labor are in the position of the Siamese twins. There can be no absenteeism with labor. It makes little difference to the capitalist where his capital is used, whether in a sewer or in an office, but to the laborer it may be a matter of considerable concern. In effect, therefore, while rent is paid for the use of land and interest for the use of capital, wages are paid for the use of men.

Then, again, wages derive a peculiar importance from the natural law summed up in the "edict of Eden" that man shall live by the sweat of his brow. For unless relieved by an inheri-

tance, he depends for his livelihood on the returns which he secures from his labor. He may it is true, as a result of previous labor of his own and others, amass sufficient wealth to maintain him in idleness during the remainder of his life, but in the world as it is, the great majority of mankind are dependent on their wages for a living. This is accentuated by the fact that labor cannot, like capital, be stored but is highly perishable.

The subject of wages, therefore, is an intensely personal one; in any theory of distribution it occupies a place of paramount importance. Labor is the primary source of all wealth, and it is in the form of wages that two-thirds of those engaged in gainful occupations receive their share of the things that make life worth while. It is no exaggeration to say that of all matters under the sun there is no one that concerns us quite so closely, from the office boy to the general manager, as the contents of our pay envelopes. But, before we see what determines the size of their contents, we should notice some practical facts about wages and their methods of payment that will give us a broader view of the wage question.

Methods of Wage Payment—Time-Work.

The two primary forms of wage payments are time-work and piecework. The former is the older and up to quite recently was the commoner. In the days of craftmanship and in the early part of the factory system when labor was not highly specialized, and the close relation between employer and employee rendered supervision easy, the time work method of payment was satisfactory. And for many kinds of work it is still preferred. In the higher positions, in small plants, or where the work is of a varied character, as farm laboring, salaries and day pay are not only preferable but often the only feasible method of remuneration. The chief advantage to the worker lies in its stability, for, especially as the length of the time unit increases, he is assured of a steadier income.

But with the change from small- to large-scale production, the time method of payment has shown its unfitness for many kinds of work, both from the viewpoint of the employer and from that of the employed. When large numbers of men are engaged in one plant on the same kind of work, there is a tendency to a

deadening uniformity—both of effort and of reward. It becomes as difficult for the superior workers to obtain recognition as for the employer to recognize superior ability. The pay comes to be based on the average worker, and the output adjusted to average pay. This kills initiative; the superior worker slackens his pace to that of the less efficient; the productivity of labor is lessened; cost is high and wages are low.

Piecework.

To increase output and stimulate individual effort, the piecework system came into prominent use. The employee is paid not by the hour, week, or month but so much per piece for work turned out. A high degree of specialization and a standardized product consisting of large numbers of similar units made this plan feasible. The rate of pay is based on the old daytime earnings. If an average worker turned out 10 units of product a day and received $2.50, the rate would be set at 25 cents per piece. Should he produce only 8 units, he receives only $2 for the day; but should he finish 12, his daily earnings rise to $3. The employer is relieved of the necessity of driving, for this system stimulates all workers and, moreover, rewards them in relation to their varying abilities. By a system of inspection, the quality of the product may be assured, though for particular work requiring a high degree of accuracy the piece-rate plan may not be desirable. Not only does the faster worker receive higher earnings but also the employer makes bigger profits; for the larger the number of pieces turned out the smaller is the amount of overhead to be charged to each and, therefore, the lower the cost of each.

Notwithstanding the advantages of this plan, in practice it has failed through interference on the side of the employer and partly through opposition from the side of labor. One cause of its failure was due to the cutting of the rates by employers. This little historical comedy affords an interesting if not flattering glimpse into human nature. Now that it was to the employee's advantage to work, he did so with a vengeance, doubling and trebling his output, in many cases, and likewise his pay. Though no doubt this increased output was abnormal, in some cases, being due to overstimulation or intense competi-

tion, in many cases it disclosed the wholesale prevalence of "soldiering." At any rate, employers, even though they gained by the increased output, could not bear to see their employees earning such unusually large sums and so cut the rates. The disgruntled employees, forced to work harder and harder to earn a small increase in pay, became wary of increasing their output and naturally suspicious of piece-rate methods.

For other reasons, piecework has been opposed by the workers either individually or by concerted action through their unions. It is a more precarious method of payment; while the worker may earn more, he may through the inefficiency of his employer earn less. The responsibility of the employer to furnish the employee with steady work is somewhat lessened. It is claimed that it leads to intense competition among the workers, resulting in overstimulation, injurious to health.

The New Combinations.

With a view to combining the advantages of time and piecework and eliminating as far as possible their disadvantages, there have arisen a number of wage systems commonly called "premium" and "bonus" systems. These recognize the right of the employee to a minimum wage and have as their basis a straight hourly rate. A definite time allowance is set for each job, and an additional compensation is paid for work completed within, or in less time than, the standard. The first of these new systems to be introduced into the United States was the Halsey premium plan. A standard time is set for each job. Usually, under this system the standard time is based on past records of performance. The workman is paid at his usual rate. But if he completes the job in less than the standard time he receives a proportion, usually one-half or one-third of the time he saves. Thus, if his hourly rate is 50 cents and the job is scheduled to take 3 hours, should he complete it in 2, he receives $1 for the 2 hours plus 25 cents for half the hour saved, in which case he is paid at the rate of 62½ cents an hour. Should the job take him more than 3 hours, he still receives the base rate of 50 cents. The workman is thus assured of a full day's pay but at the same time is encouraged by a reward to increase his output, while the employer, though he may pay the employee a larger total

wage, pays a lower rate per piece, so that high wages and low costs go together. The objection is sometimes made that under this plan the workman is paid at a lower rate for the extra work he performs; that part of the results of his increased exertion go into the employer's pocket. This is true but is partly offset by the fact that in many plants where this plan is in operation the flow of work is greatly facilitated by more efficient cooperation than usual on the part of the management.

The later systems, the most prominent of which are the Taylor differential piece-rate plan, the Gantt task and bonus, and the Emerson efficiency system, emphasize intimate cooperation between the management and the men and are characterized by the scientific accuracy with which their standard tasks are determined. The idea of scientifically determining the standard time was originated by Frederick Winslow Taylor and forms part of the theory of scientific management presented by him before the Society of Mechanical Engineers in 1903. Taylor rightly avers that the failure of the piece-rate plan was due to "the ignorance of employers as to the proper time in which work of various kinds should be done." Under Taylor's system, the best method of performing the work and a fair time for its completion are found by accurate motion and time studies. The men are carefully selected with a view to their fitness, are trained, and the performance of the work is facilitated in every possible way by the cooperation of the management. The criticism is often made that the standard times of the new systems are so arduous as to be injurious to the health of the worker. When this is the case, it is to be deplored, for it is against the best interests not only of the workman but also of the employer. But Taylor himself was very emphatic on this point, and the school of industrial engineers who have followed him are, generally speaking, conservative in the setting of the standard times. Taylor's own words on this question are worth quoting:

> These tasks are carefully planned so that both good and careful work are called for in their performance, but it should be distinctly understood that in no case is a workman called upon to work at a pace which would be injurious to his health. The task is always so regulated that the man who is well suited to his job will thrive while working at this

rate during a long term of years and grow happy and more prosperous instead of being overworked.

The most remarkable thing about the new wage systems is that they have succeeded in uniting what before seemed to most employers and employees to be most unnatural bedfellows, namely, high wages and low costs. They have demonstrated Taylor's claim that "it is possible to give the workman what he most wants—high wages—and the employer what he wants—a low labor cost—for his manufactures." Cheap labor is not always so cheap nor is the causal relation between high wages and high costs and prices so simple and inevitable as is sometimes claimed.

Some Considerations Affecting Wages.

In any estimation of wages, one point to bear in mind is the distinction between nominal and actual earnings. The old proverb that "things are not always what they seem" is true of wages as of other things. Big daily wages may not be so big if irregularity of employment is taken into account, as in the case of bricklaying and in some mining operations. A smaller daily rate with regularity of employment may, in the long run, mean larger total earnings. A high wage in a dangerous occupation or one pursued at high tension may, on account of the shortened working life of the operative, mean lower total earnings. A lower piece or bonus rate in a concern that equips its employees with the most up-to-date machinery and backs them up with efficient cooperation may result in larger earnings than a higher rate in an inefficiently managed plant. The same principle applies to a sales force on a commission basis; it is not only the commission that affects total earnings but also the cooperation which the salesman gets from the house.

Quite as important when estimating earnings at different periods or places is the distinction between *money wages* and *real wages.* Not the number of dollars in the pay envelope but the quantity of goods which those dollars will purchase constitutes real wages. Owing to the fact that changes in wages fail to keep pace with changes in the prices of commodities in general, at two different periods, though money wages remain the

same, real wages may radically differ. The idea of what constitutes a fair wage is fixed by the traditional money wage of an occupation, and in periods of rising prices considerable injustice is apt to be done because of failure to take into account the shrinkage in real wages which occurs. Not only the interest of the employer but also the evidence of the senses on both sides act as deterrents. The same amount of dollars is paid and received; and if, perchance, the number of dollars is increased, it seems to both like a real increase, whereas the addition may still leave the employee's real wages smaller than before. Some concerns during the war adopted the wage-index method of payment, raising the money contents of the pay envelopes in accordance as a price index indicated rises in the general level of prices. How this will work now that prices are falling remains to be seen. While such a plan would be difficult of general application and hardly necessary under ordinary conditions in an abnormal period such as we have just passed through, it has much to commend it. As stated in our discussion of the effects of price changes, real wages tend to vary inversely with changes in the general level of prices, decreasing in a period of rising and increasing during a period of falling prices. It should be noticed, however, that in periods of rising prices, employment is more constant, a fact which, especially in the lower ranks of labor, by increasing total earnings, somewhat mitigates the shrinkage of real wages. The reverse is true in periods of falling prices, when the dread specter of unemployment stalks among the workers, reducing their total earnings and, in many cases, bringing no wages at all.

According to an investigation conducted by the U. S. Bureau of Labor Statistics, based on the retail prices of a set of commodities chosen to represent the expenditure of an average family, the cost of living in the United States has increased, from 1913 to 1920, 16.5 per cent. Wholesale prices reached their high-water mark in May, 1920; when measured by the Bureau of Labor Statistics' weighted index, they registered 272; in June, they dropped to 269; in July, to 262; and in August, to 250. The bureau's weighted index number of the retail prices of twenty-two principal food articles, with 1913 as the base year, reached its maximum in July, registering 219; in August, it

fell to 207; September, 203; October, 198. In the usual course of affairs, wholesale prices move first, then retail prices; while the cost of living brings up the rear, held back somewhat by high rents.

Real wages are also affected by considerations outside the pay envelope. Unhealthy conditions in the plant and harsh managerial policies discount even big pay. On the other hand, pleasant working conditions, opportunity for advancement and education augment real wages. Local environment, social considerations, vacation periods, enjoyment of the work and a deep satisfaction in its results all enter into the pay which a man receives for his daily tasks.

General Statement of the Problem.

Under our present economic system, the price of human services, like the price of commodities, is determined by the law of demand and supply. When labor is urgently desired and is plentiful, wages will be low. Such a statement of the cause of high or low wages is so general as to be of little practical value. In order to understand why wages in a given trade or profession are high or low or to be able to estimate the trend of wages for a given line of work 10 years hence, our knowledge must be more definite. We need to know not only the general cause but also the underlying particular causes which together govern the action of the general law. What are the factors governing the supply? What determines the scarcity of labor, and, on the other hand, what factors govern the demand by affecting the desire for labor or its productivity?

One of the first things to bear in mind is that the wage of an individual, or class of individuals, is the resultant of a number of distinct though interrelated causes. Sometimes one and sometimes another may be the more active or conspicuous, but the wage is influenced by the action of all. A theory is simply an explanation of fact, and some theories have attempted to explain wages by attributing their determination to some one factor. The old subsistence theory of the physiocrats, which gave rise to the so-called "iron law of wages," looked at wages from the supply side and saw them determined by the subsistence of the laborer. The value of labor, like that of commodities, they

thought, was determined by cost of production. The productivity theory, as it is often explained, errs by overemphasizing the factors on the demand side. In order to obtain a well-rounded, unbiased view, we should first note the general truth that wages are the resultant of several separate though interacting factors. The next thing is to get a clear view of each of these, their mode of action, and as far as possible their relation to each other. The value of labor, like all values, is influenced not only by material things capable of measurement but also by mental forces hard to estimate. To analyze all of the factors immediate and remote which influence the wages of different kinds of labor would be a task indeed, but it is possible to single out the most important. A knowledge of these places in our hands a fairly practical answer to the question, How are wages determined? We shall first turn our attention to the factors influencing wages on the side of demand.

Wages Affected by Demand for Labor's Products.

The demand for labor is derived from that of the products produced by its aid. Any increase in the demand for the product of a particular industry will increase the demand for workers in that industry and tend to raise wages. Any increase in the price of a joint product acts to raise the productivity of its factors of production. In the chapter on distribution, it will be recalled, the productivity of nitrogen was increased by the rise in the price of wheat. In a study of the figures published in the *Monthly Review* of the Bureau of Labor Statistics on wage movements during the war, the greatest advances are shown to have taken place in those industries for the products of which the war created a special demand, such as the iron and steel industry, coal and mining, and shipbuilding. Between January, 1915, and December, 1917, in the iron and steel industry, employment increased 82 per cent, payroll 235 per cent, and per capita earnings 84 per cent! In other industries, such as printing and glass blowing, the products of which were not so urgently demanded, the increase in wages was not so extreme. From 1912 to 1917, the wages of compositors and linotype operators (newspapers) advanced 111 per cent, while those of open-hearth workers rose 187 per cent. The fact that the value

of labor depends on the demand side on the demand for its products is of fundamental importance and has many practical applications. In choosing a trade or profession, a young man should consider not only the present demand for the services which he contemplates fitting himself to perform but also what that demand will be ten or twenty years hence.

The Influence of Efficiency on Wages.

Efficiency is one of the primary causes of productivity and, hence, exerts considerable influence on wages. In looking at the nation as a whole, the more robust in health is its working population, the more alert intellectually, the more highly educated and trained, the more energetic in spirit the higher will be the level of prosperity enjoyed by all classes including labor. And this not only because of the relation between the productivity of labor and wages but also by virtue of the fact that a vigorous and enlightened working force is better fitted not merely to produce wealth but to command a fair share of it after it is produced.

The educational policies of the big corporations, the work of Taylor and the modern school of industrial engineers bear undeniable testimony to the fact that it pays to educate; while the new wage systems have demonstrated the connection between individual efficiency and wages. We are just at present interested in the relation between efficiency and wages on the demand side. In any line of business, good workers are preferred to poor ones, clever ones to clumsy, well trained to untrained, experienced to inexperienced, willing to unwilling. The more proficient a man is at his trade or profession the more he will be in demand. A first-class salesman, not necessarily a brilliant man, but a steady producer, is in greater demand than a second rater. If paid on a commission basis, the relation between his productivity and earnings will be self-evident. But if paid a straight salary, his pay will still be based on sales. About 6 years ago, a superintendent of the Carnegie Steel Company resigned to take a position as general manager of a big steel plant in Pennsylvania at a salary of $50,000 a year. In the first three months, by one invention, he reduced by 50 cents the costs of every ton of steel produced, and as their annual output ran

over 100,000 tons, he more than earned his salary by this one improvement. Big concerns are able to pay large salaries to men gifted with executive ability and constructive ideas because of the productivity of their services.

There is a disposition on the part of some to attribute the good fortune of others to luck or pull. There is no doubt but that these two take a hand in the game of life. But to those who are dissatisfied with their earnings it might be good advice to look to their personal efficiency; for often, as Shakespeare puts it:

> The fault, dear Brutus, is not in our stars,
> But in ourselves, that we are underlings.

Effect on Wages of Efficiency of Other Productive Factors.

The productivity of the worker is influenced not only by his own efficiency but also by that of the other factors cooperating with him in the productive process.

The addition to the total product that is attributed to any one of a group of productive factors and is said to determine the productivity of that one, in the sense that it is the amount that depends on its presence or absence, is, it will be recalled, not produced by that factor alone but is the joint product of all and is, therefore, influenced by the efficiency of all the contributing factors. The general result is that whenever several factors are engaged in the making of a common product, an increase in the efficiency of any one increases the productivity of each of its fellows. The productivity of labor is enhanced by improved machinery or superior organization.

N. I. Stone, who was connected with the United States Tariff Board, states that in the board's investigation in the wool industry they found that almost invariably the mills paying higher rates of wages per hour produced goods at lower costs than their competitors paying lower wages. This, the board found, was due partly to the more efficient management of the higher wage mills but, more generally, to the better machinery used in the higher-wage and low-cost mills. In the carding department of seventeen worsted mills, the mill paying its machine operatives 13.8 cents per hour had a machine cost of 4 cents per 100 pounds, while the plant paying 11.86 cents per

hour had a cost of 25 cents per 100 pounds. This was due largely to the fact that the lower-cost, high-wage mill had machininery enabling every operator to turn out more than 326 pounds per hour, while the high-cost, low-wage mill was turning out less than 48 pounds per hour. An investigation some years ago into shops operating under the Taylor system of scientific management revealed the fact that where the system was in successful operation costs had been reduced and wages increased from 30 to 100 per cent.

Effect of Improved Machinery and Organization on Demand for Labor.

The factors of production not only cooperate in the productive process but they also compete for employment. Business men are ever seeking the most efficient combination and in so doing are always ready to substitute for any one factor another which may do more work for the same cost or the same work for less cost. If the job can be done more cheaply by machinery, then machinery takes the place of labor. While machinery can never displace labor in general, it may diminish or destroy entirely the demand for a particular kind of labor, just as the old woodcut engravers were thrown out of work by the invention of the half-tone process; glass blowers, by glass-blowing machines. From this fact arises the ancient antipathy of organized and unorganized labor to labor-saving machinery. One can scarcely blame workmen for opposing a device which if it does not actually take the bread out of their mouths at least scrapes all the butter off. To tell them that it is for the ultimate benefit of labor in general is poor consolation. Whether it be salesmen discharged because of a centralization of sales through a combination of hitherto competing concerns or mechanics thrown out of employment by inventions, the immediate effect is distressing, and those who bear it are martyrs to progress. It is unfair that a few should bear the brunt of a process which enriches society as a whole. In some cases, by arrangements between the unions and the bosses, as when the linotype machines were introduced in the printing trade and the molding machines in the stove industry, provision is made for the men

to work the new machines. It was always Taylor's policy, in installing his system of scientific management in a plant, not to discharge employees who might be displaced by the changes made but to find them positions elsewhere wherever possible; that is, also, the policy today of the leading industrial engineers and of many big concerns. Such a practice is not only eminently fair but also expedient in that it tends to lessen the animosity of manual workers to improved machinery and inventions.

On the other hand, though invention whether along the line of improved machinery or methods of organization does often diminish and even annihilate the demand for a particular kind of labor, its general effect on labor in the long run is to increase demand. Machinery practically destroyed the old-time shoemaker's occupation, and inventions like the McKay sewing machine threw out of work numbers of specialized workers. But as a result of the introduction of machinery into the shoe industry, costs and prices have been so lowered that whereas one hundred years ago only the wealthy few could afford to own a pair of shoes, today they are within reach of all. And with the increased demand for shoes, the demand for makers of shoes has so grown that there are more people relative to the population engaged in the shoe industry today than when shoes were made laboriously by hand. Moreover, another army of auxiliary workers finds employment in the manufacture of shoe machinery and accessories and the raw materials required for these. It is evident, then, that if machinery throws some out of work, it finds new work for others, and wherever the demand for the product is elastic, the increase of that demand through the lowering of price acts likewise to increase the demand for labor. This is the lesson that history teaches. If Stevenson's locomotive threw a few teamsters and canal men out of work, it has redeemed itself since by finding employment for thousands of railroad engineers, conductors, firemen, locomotive builders, and so on *ad infinitum*. In the long run, machinery is a staunch ally of labor and tends to raise real wages not only by reducing the cost of commodities but also by increasing the productivity of labor and, thus, its price and by increasing the demand for the products of labor and, thus, that for labor itself.

Recent Upward Trend of Wages in United States.

The average earnings per worker in the United States showed a steady upward trend during the first quarter of the present century. There was a consistent upward movement from 1899 to 1914, a sharp advance during the years of the World War which was approximately equal to the increase in cost of living, and a more moderate advance in the period since 1921. According to the census of manufactures, the average earnings of a factory worker in 1899 was $426. In 1925, this had increased to $1,280. The annual average earnings of factory workers in 1925 were just about three times as large as in 1899 and 10 per cent higher than in the postwar boom in 1919. The Bureau of Labor Statistics' index of earnings per hour of wage earners, generally, shows that wages in the United States from 1913 to 1926 advanced 129 per cent, and as the cost of living increased 70 per cent during this period, there has been an increase in real wages of about 34 per cent since 1913. Since 1922, wages, in general, have been increasing and the cost of living decreasing—a very happy combination of circumstances for the great majority of people. Of course, it must not be assumed that all wages rose, for between 1920 and 1926 there was a decrease of 32 per cent in hourly earnings in cotton manufacturing, of 22 per cent in woolen manufacturing, of 15 per cent in iron and steel, and of 6 per cent in railroad wages. Nevertheless, it remains true that in recent years the real wages of the masses of people in the United States have increased at a surprisingly rapid rate, and the significant thing is that since 1922 this increase has taken place in the face of a fall in commodity prices. This general increase in wages has been made possible as a result of the increased productivity of labor to which attention was called in a previous chapter. And the increase in labor productivity has been due not only to the increased efficiency of labor but also largely to efficient management and the mechanization of industry.

Summary.

The share of the joint product of industry assigned to men and women for their labor is known as "wages." In a vital sense, wages differ from rent, interest, and profits in that the

latter are derived from productive property, while the source of wages is man himself. The two primary forms of wage payments are time-work and piecework. The new wage systems which have been introduced attempt to eliminate the disadvantages and combine the advantages of the older methods of wage payment. A standard task is set and the worker receives an additional compensation when the job is completed within, or in less than, the standard time.

In estimating wages, it is important to distinguish between nominal and actual earnings. Big daily wages may not be so big if irregularity of employment is taken into account. The difference between money wages and real wages should also be taken into account. Real wages are affected by factors outside the pay envelope as well as by changes in the value of money.

The rate of wages of any particular kind of labor is the resultant of two sets of factors, one influencing the supply of workers, the other affecting the demand for the services performed. On the demand side, wages are influenced by (1) the demand for labor's products; (2) the efficiency of the workers, (3) the efficiency of the other factors of production; (4) competition with the other factors of production.

Test Questions

1. Why is the share of a nation's income paid as wages of especial importance?
2. What are the two fundamental forms of wage payment?
3. What have the new wage systems demonstrated?
4. Why is it well to distinguish between *real* and *money* wages?
5. What are the chief factors influencing wages on the demand side?
6. Explain the effect of improved machinery and organization on wages.

CHAPTER XXVII

WAGES—FACTORS ON THE SUPPLY SIDE

Growth of Population—Internal.

Turning our attention to those factors influencing wages on the supply side, we come, first, to the general effect on the labor supply of an increase in population. While it is obvious that the total population and the labor force of a country are not one and the same thing, owing to the fact that the population includes many women and children, aged people, and others unwilling or unable to work, who are not engaged in gainful occupations, it is nevertheless true that an increase in the population means an increase in the labor supply or, to be exact, in the supplies of different kinds of labor. In any given country, the growth of population depends, first, on internal growth, that is, the excess of births over deaths; second, on immigration and emigration.

All discussions of population have been profoundly influenced by Malthus, who, in his essay on "The Principle of Population As It Affects the Future Improvement of Society," first published in 1798, propounded a theory that set the world agog. According to Malthus, the one great cause impeding the progress of mankind toward happiness is the "constant tendency in all animated life to increase beyond the nourishment prepared for it." This arises from the fact that all animated beings are impelled by a powerful instinct to reproduce. In irrational animals and plants, this instinct is not checked by doubts as to the future provision of the offspring, so that whenever there is liberty the power of increase is exerted and the superabundant effects are suppressed by want of nourishment. In man it is checked by reason in the shape of considerations regarding the difficulty of providing for the offspring, the sacrifices that must be made, and so on. This "moral restraint" often leads to vice, but . . . if restraint is not exercised the human race will be

constantly endeavoring to increase beyond the means of subsistence because of the fact that naturally population would tend to increase by doubling itself every 25 years or in geometrical ratio as 1, 2, 4, 8, 16, 32, while the food supply would increase only in arithmetical ratio as 1, 2, 3, 4, 5, 6. In a nutshell, the Malthusian principle of population asserts that population ever tends to press on the means of subsistence. In so doing, it is restrained by two classes of checks, the preventive, termed by Malthus "moral restraint," which restricts the birth rate; and the positive checks—misery and vice—which include all those causes which tend to shorten human life.

Malthus proved his theory by an exhaustive historical examination of the action of the checks in a large number of races from the time of the ancient Greeks and Romans to Great Britain in his own day. In principle, undoubtedly, Malthus was right, and as far as the past went he probably painted his picture of the operation of the checks none too blackly, nor, indeed, did he exaggerate their effects on the lower classes in the England of his time. But his picture of the future was somewhat darker than time has proved to be the case. The hand of progress in civilized countries has since somewhat accelerated the action of the preventive and lightened the operation of the positive checks.

Positive Checks.

The three principal checks to population acting on the death rate are famine, war, and disease—mankind's ancient enemies. During the nineteenth century, industrial progress in the principal civilized countries has placed their population in normal times beyond the reach of famine. Yet it ever hovers on the outskirts and in times of depression or sickness is a very real menace to the poorer classes; while in the hygienically more backward countries it still descends at awful intervals, as at Shantung, China, and carries off its victims by the thousands. War, too, in spite of hopes and claims to the contrary, continues to make its periodical onslaughts, and its bloody jaws are scarcely dry from its latest killing. In the case of disease, medical and sanitary science and hygienic education have done much to lessen its ravages and account for the lowering of the death rate in the principal civilized nations during the last seventy years.

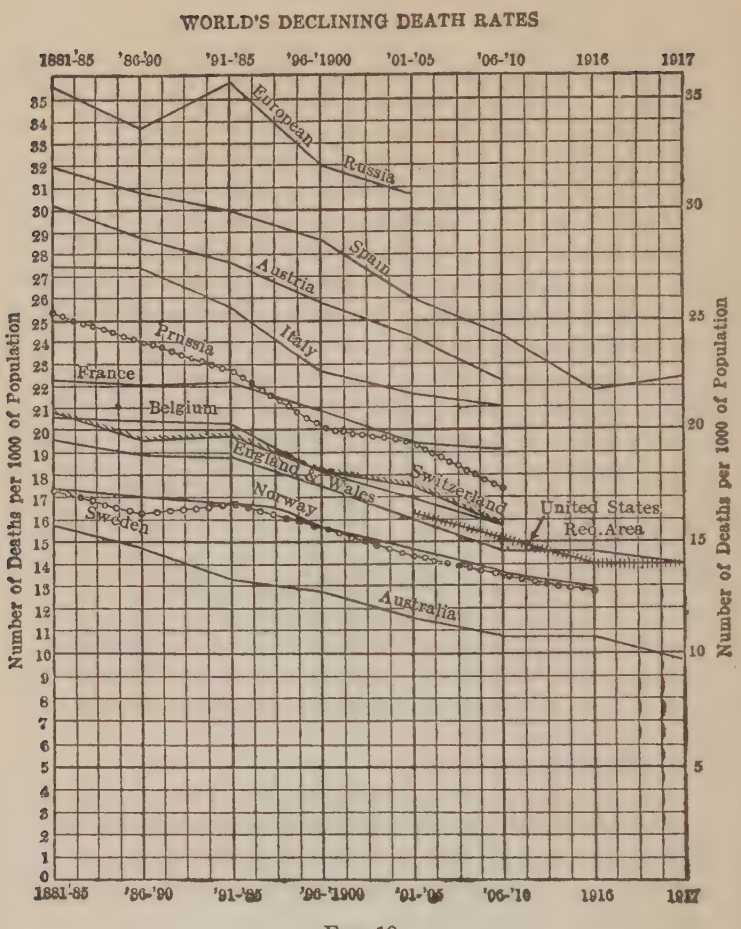


FIG. 19.

One of the most gratifying features in this direction has been the marked decrease in the rate of infant mortality that has taken place in most civilized countries. In the United States, the death rate for men and women between forty and sixty years of age is higher than in most European countries, chiefly on account of the high death rate from organic diseases of the heart, nephritis, and Bright's disease, which is attributed by some to the high nervous tension of business life in this country. A large number of deaths are due to preventable causes. The

advance of medical science, better living conditions, more attention to personal hygiene, especially in the case of city dwellers who are handicappd in obtaining the fresh air, exercise, and sunlight essential to the best of health, will tend still further to lower the death rate and prolong human life.

Voluntary Control—The Standard of Living.

Nature's crude method is to encourage the reproduction of the species by powerful instinct and cut down the surplus with her three death sickles, famine, war, and disease. Man as a rational being seeks to prevent overcrowding and its disastrous consequences by bringing fewer into the world. He is influenced by considerations regarding the difficulty and expense of the future provision of his offspring. This set of considerations, called by Malthus "moral restraint," is usually discussed in modern economic treatises under the head of the standard of living or the standard of life. In its strictest sense, the standard of living consists of those desires the satisfaction of which an individual or class of individuals considers as essential to happiness and to gain which they will make any reasonable sacrifice, such as the postponement of marriage. It is in essence a psychological thing, a concept more or less definite, represented in material life by those necessaries and comforts which a man has become accustomed to regard as his right and without which he would not consider life worth while.

These considerations may lead him to remain single or postpone marriage till late in life or to limit deliberately the size of his family. A moderate salary will enable a single man to enjoy life on a comparatively comfortable scale, while marriage means a division of his income by two and a renunciation of some of the luxuries of bachelorhood. He is reluctant to put his neck into the marriage yoke and shoulder its difficulties and responsibilities. Owing, moreover, to the increasing length of the required period of preparatory training for business and the professions, many young men when they want and ought to marry cannot afford to and are forced, perchance, to see the girl of their choice carried off by some old but wealthy rival. Nor is this matter by any means only a man's question. Many girls today earn as much as if not more than the men with whom they

associate. Such a one, with a salary enabling her to live comfortably and dress stylishly, must be genuinely in love to throw up her independence and marry a man with a salary no larger, perhaps, than her own, knowing full well that it will mean going

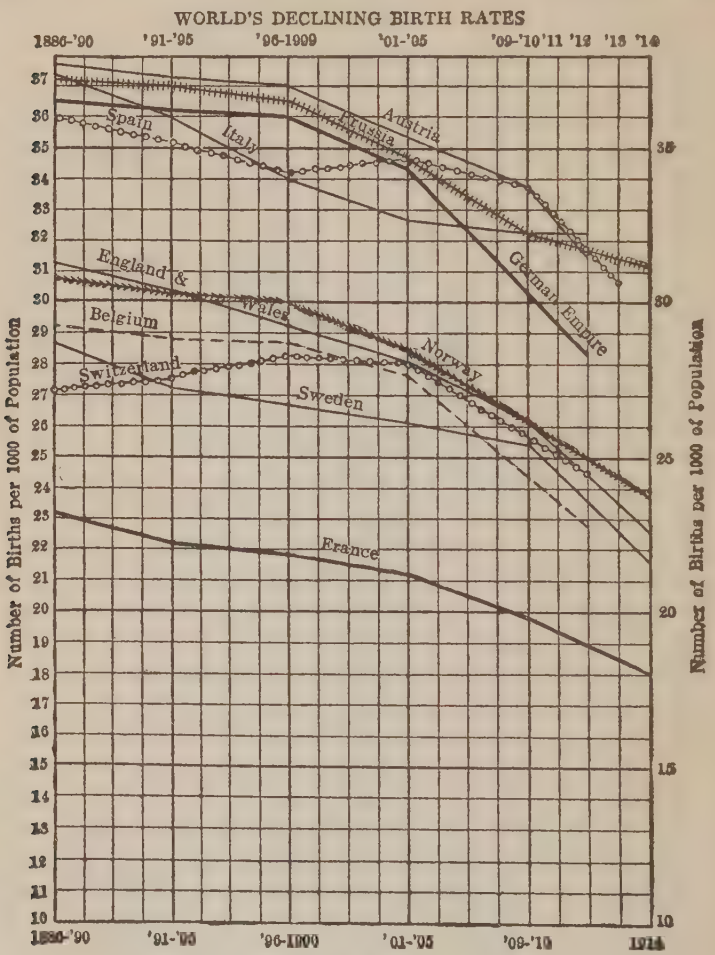


Fig. 20.

without many things so dear to the feminine heart. The "chum marriage" of our big cities may offer a loophole. Both husband and wife may work, living comfortably, even luxuriously, on the

double income in a small flat. Here we come to the third and, perhaps, the most drastic aspect of this question.

It is not only by preventing unions or deferring the marriage age but also by limiting the number of the family after marriage that the standard of living gets in its work on the birth rate. A glance at the vital statistics of the principal civilized nations for the last century leaves little doubt but that the decrease which began in the birth rates in the latter half of the nineteenth century and is still continuing has been brought about not by a decrease in the number of marriages but by a deliberate restriction of the family.

In France, where the birth rate fell from 3.16 per 100 for the period 1806 to 1816 to 2.05 for 1901 to 1911, the marriage rate dropped only 1.63 to 1.52 per 100. Figures for England and Wales show a similar relationship; during the period 1876 to 1885 the birth rate per 100 of population was 34.2; it dropped to 28.6 for the period 1896 to 1905. The marriage rates for about the same periods changed from only 16.6 per 100 during 1861 to 1870 to 15.6 for 1891 to 1900. The birth rate for France had further declined in 1913 to 1.88 per 100, while in the United Kingdom it had sunk to 15.0 per 1,000. The vital statistics of the United States have been until quite recently shamefully inadequate. With the exception of one or two states in the East, Massachusetts, for example, there has been an utter dearth of reliable statistics. The present birth-registration area of the United States covers about 80 per cent of the total population. The death-registration area covers about 90.1 per cent. Estimates based on what figures have been available indicate that the United States is following the European fashion. Indeed, statistics are hardly necessary; the large families of colonial times are becoming as rare as the large flocks of wild pigeons that once roamed the continent. The birth rate for the United States registration area in 1915 was 24.3.

A characteristic of the preventive check often remarked is the uneven manner of its action. Some concern has been expressed because of the fact that in most countries statistics show that the "higher classes," so called, are only just holding their own, if not actually failing to maintain their numbers, while the laboring classes, by virtue of their larger families, tend to in-

crease in spite of their higher death rate. Population is thus said to be growing at the bottom rather than at the top. It is a question, however, as to what part of the superiority of the higher classes is due to heredity and what to education and environment. If they constitute a superior strain of the human species, it would be a pity to let them die off. If, however, the stock of the common garden variety of mankind is capable of refinement and polish by education and environment, it might be as well to keep the walls of class division low enough to permit the free entrance of the more vigorous stock of the lower classes, to replenish the withering of the upper. It is a rather peculiar biological paradox that the qualities that fit some for success in the immediate struggle for existence unfit them for perpetuating their kind. Probably this is exaggerating the actual facts; but there is no room for doubt that the preventive check is more active in the cases of the middle and upper classes than in the laboring classes, which are not fired with the same intensity of ambition or gifted with the same degree of foresight or prudence in this particular.

Increase of Populations of Chief Countries.

Notwithstanding the decrease in the birth rates, the populations of the principal countries, with the classic exception of France, continue to increase, as the accompanying chart shows.

Statistics prove that high birth rates and high death rates usually go together owing to the more acute struggle for existence, as is illustrated by the history of China and India. On the other hand, if the birth rate is so low as to approach the death rate, as in the case of France, the population will tend to be stationary and may even be threatened by race suicide. A gradual growth through a medium birth rate accompanied by a low death rate is the sanest economic course for the older nations.

The Modern Tendency.

The continuous decline in the birth rates of the leading countries of the world, which set in during the latter half of the nineteenth century and which is still in operation, seems to augur a new principle of population for twentieth-century civilization,

a principle born of the changed economic and social conditions of modern nations. Before and during the time of Malthus, no doubt, subsistence acted as a spring pressing down on population. On its release, population increased; when it pressed down, population decreased. But the experience of the chief nations

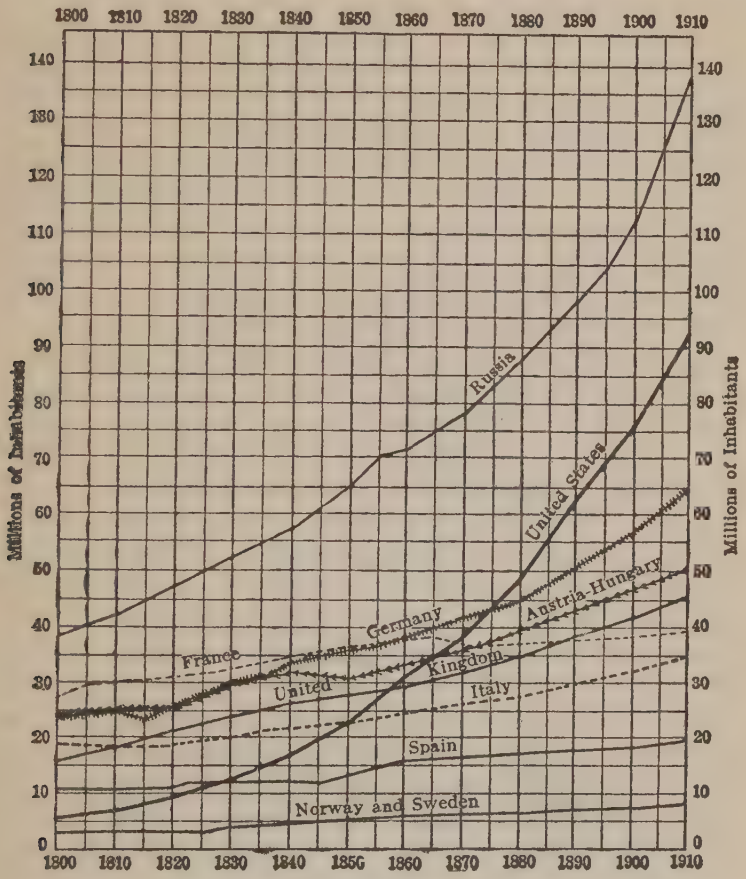


FIG. 21.

of the world during the last sixty or seventy years points to an opposite tendency. As a result of the Industrial Revolution that ushered out the eighteenth century, the wealth of the great nations has been enormously augmented, all classes have been enriched,

real wages of labor are higher than ever before. The spring has been released, yet the birth rate has failed to respond; in fact, it has decreased as wealth has increased.

The turn in the tide did not take place for the majority till the latter half of the century. France it was that led the way to the very beginning of the century. During the last fifty years, France has several times found it necessary to stimulate the growth of her population and is today offering bounties to women bearing two children or more, legitimate or illegitimate. In 1911, the deaths exceeded the births, and under the strain of war the reproductive powers of the nation again failed to keep pace with death. France may be in no danger of race suicide, but assuredly there are no signs of a tendency for population to advance so rapidly as to encroach upon the means of subsistence. Vital statistics indicate that the chief civilized nations of the world are following hard on the heels of France.

The changed economic and social conditions of modern civilized life, the rise in the standard of living, the goading of ambition, increased knowledge, the drift toward the cities all tend to strengthen the action of the preventive check. If it be true that it is the tendency for man in his natural or crude state to increase his numbers until checked by famine, war, and disease, it would seem to be the philosophy of civilization that prevention is better than cure. Rather a smaller number and that number better fed, clothed, educated, and provided with a larger proportion of the things that make life worth while than a horde of underfed, ill-clothed, ignorant creatures destined to a pitiless struggle for a bare existence. Instead of blindly increasing and allowing nature to check his numbers in her own crude and cruel way, man is controlling his own increase. The population in civilized countries today no longer presses on subsistence, but, instead, the standard of living presses on the population. Nature no longer checks man; man checks nature.

The standard of living exerts a dual influence on wages—first, by restraining the growth of population as a whole or, in the case of a particular class, by tending to limit the supply of labor; second, as has often been pointed out, it influences the bargaining power of the workers by stiffening their backs against a reduction in wages below that which they consider essential to main-

tain them in their accustomed mode of living. But the standard of living is not a fixed thing; it is based on desire, the nature of which is to grow, and through ambition it may exert a positive influence on wages by stimulating the worker to secure an advance.

Growth of Population—External.

The spectacular growth of the United States of America was one of the wonders of the nineteenth century. It is scarcely conceivable today that this great country, with its 125,000,000 inhabitants, numbered, a little over a century ago, less than 4,000,000 souls.

TABLE XV.—GROWTH OF POPULATION OF THE UNITED STATES

Census year	Population of United States exclusive of outlying possessions	Per-centage of increase	Census year	Population of United States exclusive of outlying possessions	Per-centage of increase
1790	3,929,214	....	1860	31,443,321	35.6
1800	5,308,483	35.1	1870	38,558,371	26.6
1810	7,239,881	36.4	1880	50,155,783	26.0
1820	9,638,453	33.1	1890	62,947,714	25.5
1830	12,866,020	33.5	1900	75,994,575	20.7
1840	17,069,453	32.7	1910	91,972,266	21.0
1850	23,191,876	35.9	1920	105,683,108	14.9

Needless to say, this rapid growth was not wholly due to the natural increase of births over deaths but largely to immigration. During the last 100 years, over 29,000,000 inhabitants of the Old World sailed the seas to try their fortunes in this new Eldorado of the West. From 8,385, in 1820, their numbers increased to 1,026,499, in 1905, and before the war cut their coming, they were streaming in at the rate of over 1,000,000 a year. In the past, this country has had ample land to accommodate this vast perennial influx, but it is evident that if the same rate of coming were to be maintained during the twentieth century, overcrowding must eventually result. The density of population

of the United States increased from 4.5 to the square mile, in 1790, to 30.9, in 1910. We are still fortunately situated in comparison with the older nations of Europe. France has a population of 191 to the square mile; the United Kingdom, 379; the German Republic, 324; Italy, 331; while crowded little Belgium has 673 to every square mile. But while there is still plenty of elbow room in this great country, the days of abundant free land are gone, and we talk today of the necessity of conserving our once apparently illimitable natural resources. Indeed, it is even whispered that the cost of our food is already being raised by the action of that arch enemy of growing populations, the law of diminishing returns. Before the World War, immigrants were pouring into this country at the rate of about 1,000,000 a year. In recent years, the number admitted has been strictly limited by our new immigration laws. Since 1924, the permissible number of immigrants, except from North and South America, has been limited to 2 per cent of the number born in the given country of origin who were resident in the United States since 1890—certain relatives and minor classes being exempt from the limitation. This has drastically reduced the number of newcomers to this country. The total number of immigrants admitted to the United States in the calendar year 1927 was about 324,000, which was 4 per cent less than in 1926.

Immigration, like the standard of living, does not affect all classes of the population equally. During the earlier part of the nineteenth century, the majority of our immigrants came from the United Kingdom, Germany, and northwestern Europe; latterly, southern Europe has been furnishing us with the great part. The large majority of these are of the lower classes; in 1913, 269,000 were illiterate. Of the 376,776 Italians who immigrated to the United States in 1914, over 28 per cent were agricultural and 29.4 were day laborers. Over one-half of the total immigration, excluding those having no occupation, in the fiscal years 1910 to 1914, were unskilled workers. In the fiscal year 1926 to 1927, the unskilled constituted 36 per cent of all occupations. While immigration adds to the number of professional and skilled workers, it increases most of all the supply of unskilled labor.

The immigration question is plainly not one merely of num-

bers but of kind. The wisdom of admitting into the population a large element whose standard of living is below that of the native born has been doubted. So far, the country's capacity for assimilation does not seem to have been seriously strained. A more real though more subtle danger from a continuous influx of immigrants is the maintenance of a stratum of population to perform the rough labor of the nation, which, though its numbers would be changing, would itself be permanent and possessed of a standard of living below that of the native American laborer. Such a condition must inevitably result in lowering the dignity of labor in the eyes of the native American in much the same manner as it was lowered by slavery in the eyes of the Southerner. A wise immigration policy will seek to regulate not only the number but also the character of the immigrants admitted, discriminating between not only the fit and the unfit morally but also the fit and the unfit industrially, encouraging those classes for whose labor there is a demand and discouraging those of a kind of which there may be already an oversupply.

Supplies of Different Kinds of Labor.

We have used the term "labor supply" in a loose and general sense. For there are as many different kinds of labor as there are different sorts of land, and the quantity of each kind that is forthcoming at given prices constitutes its supply. The labor supply of a country consists not of one homogeneous supply but of a number of separate supplies of different kinds of workers.

For the sake of convenience, these are often divided into groups or classes. The various kinds of common labor may be included under unskilled labor. Next in order comes the great army of semiskilled workers. Skilled mechanics of all kinds form a class by themselves. Leaving the factory, we might class together the rank and file of office workers including salesmen and others who work out of offices. The general run of professional men, doctors, lawyers, artists, engineers, etc., constitute a distinct class. About on a par with these are the smaller executives, the heads of departments in the big corporations, and the officials or owners of smaller concerns. Last but not least we come to the real aristocrats of labor, the big business executives, the Garys and the Morgans, with whom we might include

the Charlie Chaplins and the Carusos and other eminently successful and productive members of the professional classes. Each of these classes contains a number of distinct occupations, and the question is, What are the chief factors limiting the numbers of workers entering these?

Natural Ability.

In the unskilled and semiskilled groups, the numbers are more directly dependent on the growth of population and, in the United States, are especially influenced by immigration. But in the skilled and professional classes, the supply of workers available in any occupation is limited by other factors, among the most important of which are native ability, education, and social environment. The importance which scientific management has attached to the selection of men for even the most menial tasks, such as handling pig iron and shoveling, shows that some natural aptitude is requisite for the proper performance of any kind of labor. But, in general, of course, it is true that whereas there are many fitted for those humbler tasks, there are comparatively few gifted with the high degree of intellect and personal ability which are demanded for handling big business or for exceptional success in the professions. For one Goethals able to engineer a project of the proportions of the Panama Canal, there are a thousand who could only handle a shovel. Certain kinds of work, such as illustrating for advertising, require special types of ability possessed by comparatively few. Natural aptitude and hereditary ability place a limit on the supplies of those eligible to fill positions of this sort.

Education and Training.

But it is the difficulty and expense of securing the necessary education and training which act as the great check on the numbers entering the trades and professions. To apprentice a boy to a trade requires a financial sacrifice on the part of the parents as well as patience and pains on the part of the apprentice, while preparation for a professional career is today a long-drawn-out and expensive matter. It is not only the expense involved but also the time and effort. Were all kinds of higher education made free as far as tuition goes, the lure and necessities of the

present and the continuous effort over a number of years that must be put forth to complete a full medical, engineering, or other professional course would still serve to limit the number availing themselves of it.

The tendency all along the line is for the professional schools to raise their entrance requirements and extend the length of their courses. Many medical schools which a few years ago admitted students straight from high school now require two years of college or even a full A.B.; law and dental schools are following suit. Businesss itself is rapidly becoming a profession in that those who aim to fill all but the most lowly positions must obtain some preliminary training, while the younger generation entering the business arena is being equipped with a training almost as thorough in the new schools of commerce of our universities as that of their brothers entering the older professions. The trend in our new schools of business administration is toward extension of the course from two to four years. In the realm of accounting, most states require those eligible for the C. P. A. examinations to have had a high-school course in addition to the grammar-school grades previously sufficient. This raising of the educational fences around professional occupations tends to restrict the number of entrants and raise the rates of remuneration. The cost of preparing for a trade or profession acts in a somewhat similar manner on the price of labor as the cost of production on the price of commodities. The professional remuneration must be sufficient to offset the cost of preparation, or the supply of those entering will decline. In those occupations demanding a lengthy and expensive training, earnings will tend to be higher because of the fact that the number fitted to enter them is limited to the few who have had the necessary general and special education.

How, then, account for the fact that many who possess a fine education earn but a pittance, whereas others who have never seen the inside of a college make fortunes? There may be many and diverse reasons; financial success is the resultant of a number of forces any one or more of which may be the determining causes. In the first place, the difference may be due to natural ability or the lack of it. The educated ass is, after all, but an ass, and no waving of the educational wand will transform him

into a lion. Then, too, some who go through college acquire but a diploma and a coat of social polish, whereas others who have never seen a college campus, by intense intellectual effort applied to their work and by extensive reading and varied experience, acquire a genuine and practical education. The education of some college men comes to a full stop with their graduation exercises. There are those who believe that an academic education though it may make a better man does not make a better business man, in that it gives him interests intellectual and otherwise which are detrimental to the intense and narrowly concentrated habits demanded for the accumulation of money. This, of course, cannot be said of a technical education or of a college course supplmented by a specialized business training. Also, the demand in many skilled occupations is small and inelastic, and oversupply may ensue as a result of undue popularity, as in the case of trained chemists in Germany. The combined efforts of the German government, the universities, and industry to develop the dye industry and chemical research in the years preceding the war resulted in attracting an extraordinary number of able men into chemistry. Their numbers were so great that the inevitable competition between them for positions made the salaries exceedingly small in comparison with those received by men of equal ability and training in other fields.

Social Environment.

Entrance into certain occupations is further influenced by social considerations. Class distinctions are less marked in the United States than in the older nations, yet here as everywhere they exist. The majority remain in the class into which they are born. The extraordinary man in whatever class will force his way to the top, but, after all, these are the exceptions even in the United States. Only the unusually clever or the unusually dull will rise or drop out of their respective strata. Born in a favored class, surrounded with every care and attention from babyhood up, better nurtured, played upon by the subtle influences of a cultured home environment through imitation and suggestion, well educated, and then, with the aid of family or social connections launched out on his career after graduation—compared with the son of a day laborer such a one has a flying start in life

and must be more than usually stupid to fall to the rear in the race. The presumption is that he, like the laborer, will stay among his own people. In the course of generations, families rise and wane like kingdoms, but the process is a slow one. Social environment means opportunity, and opportunity plays a great part in business and professional life. While it is true that the higher positions in political, professional, and business life are possibilities to all classes, they are not probabilities. But in the world as it is, the majority in the lower classes are debarred from ever reaching them. Social environment means preferment for some and expulsion for others; it tends to limit the number available for many positions.

Interaction.

There is considerable difference of opinion as to the relative importance of native ability, education, and environment. Adam Smith expressed the opinion of his time when he said that the difference between the philosopher and the porter was chiefly due to education, custom, and habit. The discoveries of Mendel and Darwin have tended to emphasize the importance of heredity. Clay, the English economist, maintains that:

> . . . incomes derived from work vary far more than do native ability and capacity. . . . All operations needed to supply all the ordinary needs of life have been studied and simplified until any person of ordinary intelligence *provided he has the necessary training* can do most of them. The opportunity of training and entry into trades is then the most important influence and the fundamental reason for the difference in the wages of different occupations. Low-paid occupations are low because they are overcrowded, while a high remuneration is secured for an occupation by restricting entrance to it.

Native ability is, perhaps, the limiting factor for the highest positions. As Taussig aptly puts it, "Generals probably are born, not made. But colonels and captains can be trained." The supply of generals in the industrial army is limited by the rarity of genius, but the limiting factors for captains and colonels are more usually education and enviroment. The abstract question as to which is the most important is best left to the tender mercies of debating societies. The vital thing to notice is that all

three play a weighty part in the determination of wages. No hard-and-fast rules can be laid down that will apply to all cases or conditions. All three are omnipresent; they act and react on each other, and sometimes one and sometimes another is the determining factor. To the individual in his little day, education and environment, in that they are more or less under his control, are worthy of more practical consideration. As someone has said, we cannot choose our parents but we can pick our environment. The easier this is made in any nation the freer is education to all; the lower the walls of class distinction the more nearly will differences in wages tend to correspond to differences in natural ability. And if it be true, as it probably is, that the ability required for the performance of the great majority of tasks is possessed by the great majority of folk, then there will be a tendency toward a greater equality of earnings at a higher general level.

Organized Control of the Demand and Supply of Labor.

Under conditions of perfectly free competition on both sides, the price of a commodity or service is said to be determined by the natural action of the law of demand and supply. Rarely today is anything bought and sold under such conditions. Usually, there is some agreement or combination on the part of either buyers or sellers or of both. Any such control over the demand or the supply constitutes interference with the natural action of the law. And if the control is sufficient to influence value, the price can no longer be said to be determined by the natural action of demand and supply but is regulated by monopolistic control on the part of either the buyers or the sellers. If both the supply and the demand are under absolute monopolistic control, then the price will be set by bargaining. Where competition is perfectly free, the natural interaction of the forces of demand and supply tend to establish an equal price, a fair price in that it satisfies both sides. But in the world as it is today, free competition seldom exists, and organized control of the forces on one side or the other places the fixing of the price more or less in the hands of one side, which thus has a strong temptation to disregard the interests of the other side and set the price high or low according as that side is seller or

buyer. And the rather humorous thing is that if any objection is raised and governmental interference is proposed, the manipulators loudly assert the divine rights of the law of demand and supply and bitterly assail any interference with its "natural" action. Where, however, the forces on both sides are organized, both meet on an equality; and an amicable and fair price is again the natural result.

The demand for labor today in many occupations is largely an organized one. The employer may be an individual, but in these times of large-scale organization he is apt to be a big corporation, employing thousands of men, perhaps, as in the case of the United States Steel Corporation, controlling a large proportion of the workers employed in one industry. But even if there are only a few big employers of labor in one trade and there is perfectly free competition among these for men, monopoly cannot be said to exist. Just as soon, however, as these big concerns combine for the purpose of hiring men and act together making agreements as to what they will or will not pay, free competition between them disappears and in its place comes an organized demand for labor. This is made possible in industries today by the existence of the numerous kinds of employers' associations. The various forms of monopolistic agencies previously described place in the hands of employers a control over the demand for labor similar to that which they exercise over commodities. Not only are the employers in one branch of industry organized but also, by means of their general associations such as the National Manufacturers' Association, they are capable of concerted action as a whole.

It follows that if labor remains unorganized under such conditions, it must ever be at the mercy of capital. It is, of course, not necessarily a case of warfare; neither the organizations of capital nor those of labor are designed primarily for fighting but for legitimate and useful purposes. Organization, nevertheless, places a dangerous power in the hands of one over the other when that other is unorganized. In the first place, even when it is a case of man to man, the worker is at a disadvantage. His labor is perishable and cannot be stored like commodities. It may be withheld, but as in the great majority of cases the laborer depends on his labor for a livelihood, loafing means

starvation for himself and family. What is a great loss to him may to his employer mean merely the loss of one man among many. As a bargainer he is, as a rule, no match for his employer in respect to position, education, or knowledge of conditions; he is the under dog.

Labor's sole hope lies in organization. Only when the workers are organized will they be enabled to meet their organized employers on an equal footing in the bargaining process. Through their organization they can maintain a reserve fund to permit their exercising their inalienable right of withholding their product when not offered what they consider a fair price. They may also follow their employers' example and maintain paid representatives at the state and national legislatures to protect and advance their interests in respect to legislation. They are enabled to sell their labor through skilled representatives even as the corporations buy it by specialists trained for that purpose. Through their trade-union secretary or other representative they appear before their employers not as lone individuals but as an organized group. The employer risks the loss not merely of one man but of many. By means of apprenticeship rules and sometimes other, perhaps, more questionable methods, they are enabled to regulate the supply of their product to the demand. In all this, labor is simply falling in line with the inevitable trend of the times by substituting collective for individual action. Like the entrepreneur, the worker is selling his product through an organization. For this purpose as well as for fraternal reasons outside our present discussion, the trade union has come into being.

That labor has a right to organize under our present system there can be no question. If the workers sell their labor in competition with each other to an organized body of buyers, they, like the farmers of old, must ever be the dupes of the law of demand and supply. It is a clear case of a buyer's monopoly. A fair wage is imperilled when the employers who represent the demand for a particular kind of labor are organized and the workers who constitute the supply are unorganized. Both sides being organized, they meet on an equality, the only just basis for a bargain. It is labor's human right to organize; and not only its right but also its necessity. The workers do so not to

gain a profit but to make a livelihood. Neither does it betoken a very broad-minded attitude on the part of some who have taken a conspicuous part in recent business combinations and declaimed loudly against destructive competition in the selling of steel and other things that they should remain blind to labor's danger from "destructive competition" and refuse to recognize labor's right to organize. Nor is it a valid argument against labor organization that trade unions or their officials have sometimes done some things which they ought not to have done. Restriction of output or violence are to be deplored for the worker's sake as well as for others and should be punished. But big business is by no means a saint, and on both sides the wrong sometimes done is beside the point. Both capital and labor are benefited by organization, which, when applied to both, means a more harmonious adjustment between demand and supply and the only true basis for a fair wage under our present large-scale system of production.

Summary.

The supply of labor, in general, is influenced by the growth of population. In any given country, the growth of population depends, first, on internal growth, that is, the excess of births over deaths; second, on immigration and emigration. The Malthusian theory of population asserts that there is an ever-present tendency for population to press on the means of subsistence and that in so doing it is restrained by two classes of checks, the preventive and the positive. The three principal positive checks are war, famine, and disease. War still periodically mows down the world's population. The industrial advance of the great nations in the last hundred years has greatly reduced death by famine. Medical and sanitary science and hygiene have reduced disease and are, no doubt, chiefly responsible for the lowered death rates of recent years.

Man as a rational being seeks to prevent overcrowding, being influenced by considerations regarding the difficulty and expense of the future provision for his offspring. These considerations may lead him to remain single or to postpone marriage till late in life or deliberately to limit the size of his family. The declining birth rates of the great nations of the world are evidence

of the increased activity of the preventive check. Notwithstanding the decrease in birth rates, the populations of the principal countries, with the exception of France, continue to grow. The spectacular growth of the United States since 1790 is largely due to immigration. Since the war, immigration into the United States has been restricted by law. A wise immigration policy will seek to regulate not only the number but the character of those admitted.

The supply of workers in any occupation is limited by native ability, by the cost of education and training, and by social barriers. The supply of workers in certain trades is limited through the regulations of trade unions. The demand for labor in many trades today is an organized demand. If the laborer is unorganized, he is at a disadvantage. To combat this disadvantage, as well as for fraternal reasons, trade unions have come into being.

Test Questions

1. Give a brief account of the Malthusian theory of population.
2. Explain the action of the three positive checks on population.
3. Explain the action of the preventive check on population.
4. What is meant by saying that the population of a country is growing at the bottom instead of at the top?
5. What is the "modern tendency" in reference to the populations of the chief civilized nations?
6. Mention some of the considerations entering into a wise immigration policy for the United States.
7. How do natural ability and education affect the supply of labor in a given trade or profession?
8. What effect do trade unions have on wages?

References

Bloomfield, D., "Modern Industrial Movements"; "Employment Management."
Bloomfield, M., "Management and Men."
Clay, H., "Economics for the General Reader," Chaps. XVI, XVII.
Cairnes, J. E., "Political Economy," Part II, Chap. I.
Clark, J. B., "The Distribution of Wealth," Chaps. VII–XI.
Davis and B. Schwartz, "Immigration and Americanization."
Edie, L. D., "Principles of the New Economics," Chap. VI.
Ely, R. T., "Outlines of Economics," Chaps. XXI, XXII.

FETTER, F. A., "Economic Principles," Chap. XIX.
GANTT, H. L., "Organizing for Work."
JENKS and LAUCK, "The Immigration Problem."
JEVONS, W. S., "Theory of Political Economy," Chaps. V, VIII.
KIMBALL, D. S., "Plant Management," Alexander Hamilton Series.
LEVERHULME, LORD, "The Six-hour Day."
MARSHALL, A., "Principles of Economics," Book 6, Chaps. III–V.
MITCHELL, J., "Organized Labor."
MOORE, H. L., "Laws of Wages."
RUBINOW, I. M., "Recent Trend of Real Wages," *Amer. Economic Rev.*, Vol. IV, pp. 793–817.
SELIGMAN, E. R. A., "Principles of Economics," Chap. XXVI.
SMITH, A., "Wealth of Nations," Book 1, Chap. VIII.
STREIGHTOFF, T. H., "The Standard of Living."
TAUSSIG, F. W., "Principles of Economics," Chap. XLVII.
WALKER, F. A., "The Wages Question."
"Problems of Population and Parenthood," National Birth Rate Commission of Great Britain, *2d Rept.*

CHAPTER XXVIII

INTEREST

From the point of view of distribution, interest is the share of the joint product of industry paid for the use of capital. Just as rent is paid for the use of land, interest is paid for capital. Because of the service capital performs in our industrial system, those who borrow it are able and willing not only to return it intact at the close of the period of the loan but also to add something extra out of the profit which they have derived from its use. Not only is the payment of interest justified by the service which the borrowed capital renders, but, also, it is necessary to induce the supply of surplus wealth demanded by our economic system for the purpose of production. Capital is not furnished freely by nature in unlimited quantities like air but is brought into existence at an expenditure of labor and saving; therefore, some stimulus is necessary to insure an adequate supply and to induce those who possess it to abstain from its use and loan it to others. In other words, capital has value for the same reason that other things have, for its scarcity on the one side and its utility on the other. Its price or the rate of interest is determined by the supply of capital in relation to the demand for it.

The Relation Between the Loanable Capital Fund and Concrete Capital Goods.

We have already shown how capital comes into existence by labor and saving. Capital consists of the products of past industry saved and used for the purpose of further production. The fact that this saving is represented today by money makes it necessary to point out more clearly the connection between the money savings and the actual capital wealth saved. All money savings come from the money incomes of the people, from

rents received by owners of land, from the wages of workers, interest of owners of capital, from the profits of entrepreneurs. These, instead of receiving in kind their shares of the commodities which they have assisted in making, are paid with money. Part of this money they spend for commodities and services to satisfy present wants. To society the amount thus spent on consumption goods measures the value of actual wealth consumed. But the amount which they refrain from spending measures the value of actual wealth saved. This money and currency saved constitute the capital fund of the nation. Part of it is reinvested by those who have saved it in their enterprises. Part of it is deposited in commercial or savings banks, paid as premiums to insurance companies, to building and loan associations, or for the bonds of municipalities, railroads, or industrial corporations, is loaned through these agencies of investment to business men who ultimately exchange it for concrete capital goods. It is thus evident that the origin of the money and credit which constitute the loanable funds of the nation is the supply of actual wealth produced by the community and saved. The loanable capital fund simply represents and measures the value of concrete capital goods.

The Supply of Money and the Rate of Interest.

The supply of loanable capital funds depends on the quantity of actual wealth saved. This needs to be emphasized because of the erroneous though very plausible belief that the supply of money and credit *is* the supply of capital and that its extent determines the interest rate. But the total supply of money and credit is by no means identical with the supply of loanable capital funds. A large part of the former is required for consumption purposes, and only that part is available for loaning which is not required for present spending. An increase in the quantity of money and credit means higher prices; a decrease results in lower prices, and it is chiefly by reason of the effects of rising and falling prices on the supply and demand for capital that the interest rate is influenced by money and credit. The temporary effect of an increase in the monetary supply would, indeed, be a lowering of the rate of interest, but a continued increase results in raising it. As we saw when studying prices,

a period of rising prices stimulates business enterprise. This increases the demand for capital and tends to raise the rate of interest. The opposite is true as a result of a continued decrease in the supply of money and credit. Falling prices discourage enterprise and decrease the demand for capital. As stated by that eminent authority on money, Joseph French Johnson:[1]

> If the adjustment of prices is perfect, the supply of money not being increased except to meet an increasing demand, the rate of interest will be entirely independent of the amount of money in existence. The saving and productive capacity of a people upon which the rate of interest depends is not a product of the money supply but of their thrift and energy and of the country's natural resources.

Saving and the Supply of Capital.

The supply of loanable capital depends on saving. What, then, are the influences governing the savings of a nation? The new capital of a nation is drawn from two main sources. A large part, much larger than is usually supposed, is derived from the reinvested surpluses of business concerns. According to the estimate of David Friday[2] based on an analysis of the net incomes of all corporations in the United States, the total capital from this source in 1919 was placed at $2,800,000,000. The balance of the nation's new capital depends on the savings of individuals. The total savings for 1919 from all sources from all business concerns including the reinvested savings of farmers and from individuals were estimated by Friday at $15,000,000,000. The ability and willingness of people to save depends on the amount of their incomes and their thriftiness. A minimum income sufficient at least to satisfy the vital necessities of the present is a prerequisite to any saving at all. Savings come out of surplus and it is obvious that a bare subsistence leaves nothing to save from. Present needs have a preferred claim on income, the future can lay claim only to the excess above the

[1] For a detailed explanation of the relation between money and the rate of interest, see Joseph French Johnson's "Money and Currency," which is the most able and brilliant work written on that subject by an American.

[2] "Profits, Wages and Prices."

minimum requirements of the present. The very poor are by stern necessity compelled to live from hand to mouth; safety-deposit boxes and bonds exist not for them. In every country there is a substratum of the population living in this condition. These, it is evident by virtue of their poverty, are ruled out from contributing to the capital funds of the nation. Not much better off in regard to the mere ability to save even in this the most favored land of the worker is the rank and file of the laboring and lower-paid portion of the clerical classes, who, though their incomes are without doubt above a bare subsistence, yet admit of scant opportunity to save except to the most thrifty. They do, indeed, save temporarily, but their two dread enemies, sickness and unemployment, wipe out their little stores as rapidly as they gather them together. Like Alice in Wonderland, with all their running they get nowhere. On the other hand, the very rich with incomes far in excess not merely of their needs but of even their lavish wants save large sums with ease. The accumulations of this class probably furnish the major part of the capital funds of the nation. Between these extremes whose savings or lack of savings are conditioned chiefly by the size of their incomes lies the great mass of the middle classes, the extent of whose accumulations depends more on their willingness to save than their mere ability, on their thriftiness rather than the size of their income.

In turning from the material to the psychological side of saving, we find its essence to be a conflict between present and future wants. To the great majority saving involves sacrifice, the abstaining from the satisfaction of present wants in order to provide the means for supplying a future satisfaction. This is the essence of thrift. In order to save up for a home or for old age, the thrifty deny themselves daily. Psychologically, it resolves itself into the balancing of a want for a present good, intensified, perhaps, by a strong appeal to the senses, against the colder, intellectual desire for something in the future.

One of the first secrets of thrift, then, is the ability to control present wants. This some people never learn to do. Needs have their limit but wants are of infinite elasticity. No matter how large the incomes of some, they never have more than enough to live on. The wants of the majority increase as rapidly as, if

not more rapidly, than their earnings. Thousands have found it more difficult to save on an income of $5,000 than when they were earning less than half that sum. An excellent plan, but one seldom adhered to by those starting out on their careers, is that of banking one-half of all increases in earnings. This fifty-fifty plan of division between present and future if generally practiced would bring modest fortunes to thousands who are now drifting toward a penniless and dependent old age. That large, happy-go-lucky class whose hearts all beat to the fond belief that they "have nothing to save" includes the man with $18,000 as well as his poorer brother with $1,800. And though each honestly feels that if he were only receiving a couple of thousand a year more he would surely have a safe-deposit box bulging with bonds, the human likelihood is that his wants would bulge more rapidly than his income. The rare art of saving as the sage would put it depends not only on the greatness of one's wealth but on the fewness of one's wants.

But if the control of present wants constitutes the negative side of saving, the positive side consists in the cultivation of wants for the future. These furnish the motive power for saving and are the products of the imagination. Foresight is the mainspring of thrift. In no other power do men vary more than in their ability to visualize the future. The degree in which this important faculty is possessed is, to a large extent, the measure of the modern man. Many there are who fail to show even a trace of the instinct that teaches the dog to bury his bone and the squirrel to secrete his winter store of nuts. The southern darky is perfectly happy as long as his body is warm and his stomach filled; others look but a few days ahead. Still others, founders of families, builders of big industries, statesmen, plan for generations unborn. Such men as the Astors, the Hills and Harrimans, the Vails and the Roosevelts, gifted with vision into the distant future, tower above the shoulders of the multitude.

Foresight marks the development of both races and individuals. Young races as well as young people live mainly in the present. The logical time to save is in youth or middle age when energy is at its zenith, but the natural time seems to be toward the tail end of life when oncoming old age begins to herald its approach by decreased vigor or twinges of rheumatism. Not

till most men get well into their forties do they realize the necessity of some provision for old age. They are then in such a hurry that instead of investing they take to speculation and end up by losing all that they ever had.

With the average man and, in particular, the average young man, present wants are dominant not merely because they largely spring from the bodily appetites but because they are reinforced by the seductive appeals of the senses. What the eye sees the mind is apt to want. This natural fact makes saving in the city harder than in the country. The city dweller undergoes a continual bombardment through the senses from the attractive wares displayed in store windows and in use by passersby. He and, in particular, his wife live in a most tantalizing atmosphere of temptation. They are forever seeing something they want which, in all likelihood, they would not have wanted had not their desires been deliberately stimulated. It is different with future things, such as next year's vacation, a home of one's own, or provision for old age; these are not, as a rule, visible to the physical eye but to the eye of the mind which alone has the power of peering into the future. More than on any other one thing thrift depends on imagination, the faculty by means of which all ideas are created including those which embody wants for the future.

A third requisite to thrift is will power. Saving is a Marathon race in which many start but few finish, and the reason is the same in both cases, namely, lack of staying power. Will power, according to modern psychology, is the ability to keep an idea permanently in mind. Most people start out to save for something or other at one time or another, but the failure of their savings actually to materialize is commonly due to the lack of permanence of their wants for future things which are ousted from their minds by the flow of new wants borne of the ever-recurring present. The present is always with us, the future ever beyond. Saving necessitates the keeping of an idea permanently in the mind. It involves continuous concentration upon a single idea. Now, a purpose of any kind, to be retained in the mind in the dynamic state, requires to be fed just as a fire under a boiler must be fed or it ceases to generate sufficient power to produce action and finally dies out. The most com-

mon reason why men fail to achieve in saving and in the larger field of life itself is because they fail to maintain the desires on which all achievements depend for their motive power.

Finally, a definite plan of saving is a great aid. Here a number of institutions, savings banks, insurance companies, building and loan associations, fraternal organizations, and clubs of various kinds perform a useful function in aiding would-be savers to save regularly according to some prearranged plan. The arrival of the baby bond and the installment plan of purchasing securities makes it possible for almost anyone who wills to save easily and systematically.

Of course, saving, like every other virtue, is capable of being carried to excess, but with human nature as it is, and in the face of statistics which indicate that 93 per cent of those reaching the age of seventy-five are dependent on work or charity for their support and 90 per cent of the population die intestate, there is little danger of erring on the side of thrift. He who saves confers a benefit not only on himself but also on the nation, which he assists by supplying it with capital for productive purposes. This lesson requires to be driven home for the sake of society at large and of the individual, whose interests, in this case, are parallel. The necessity and advantages of thrift should be taught in the schools, but in the absence of this every man who is interested in getting along in the world should see to it himself that he is fully alive to the value of saving. The words of James J. Hill along this line are well worth quoting:

> If you want to know whether you are destined to a success or not you can easily find out. The test is simple and infallible. Are you able to save money? If not drop out. You will lose. You may think not but you will lose as sure as fate for the seed of success is not in you.

Source of the Demand for Loanable Capital Funds.

In turning from the side of supply to that of demand in order to see the real forces that determine the interest rate, it is also well to emphasize the fact that the source of the demand for capital funds is the productivity of concrete capital goods. It is often said that "money breeds interest." This, of course, is true in a superficial sense, but as an explanation of the payment

of interest it stops short of the main facts. The real reason that money is able to breed interest is because business men by means of it can secure buildings, machinery, materials, land, and labor which under their management produce a greater amount of wealth than they originally cost. Out of this extra wealth interest is paid for the use of the money with which these productive capital goods were obtained. It is obvious that gold or dollar bills cannot grow corn or make shoes. But they do enable the farmer to procure the seed and the shoemaker the machinery by means of which they are able to produce corn and shoes. It is purchasing power which is borrowed and purchasing power which is returned, but it is out of the productivity of what is purchased that interest is paid. The true source of interest is, thus, the productivity of capital goods. The manner in which these aid production has already been explained.

In its broadest sense, interest is the payment made for a loan of wealth. We have spoken only of wealth loaned for productive purposes. Money is often borrowed for public or private consumption. Governments, municipalities, and private individuals borrow for the purpose of spending to satisfy present wants and are willing to pay back more than they borrowed. In olden times, when most borrowing was for immediate use, arising out of the necessities or misfortunes of the borrowers, whose urgency was often taken advantage of by unscrupulous money lenders, as it still is today, the payment of interest was looked at askance and condemned by religion, law, and public opinion. While the exaction of an exorbitant rate of interest is, of course, to be deplored, there is no just reason why a person who borrows the wealth of another and uses it for his own ends should not pay for that use. The reason of the prejudice against usury, as it was termed, apart from the aversion to the practice of extortion, was the failure to see the real source of the payment. It was money which was borrowed and money which was paid back; and as Aristotle long ago pointed out, money cannot itself make more money; hence, there could be no legitimate reason why the lender should demand back more money than he loaned. The source of the service performed by the money borrowed is derived from that which is purchased with the money or, to be strictly accurate, the want which it

serves to satisfy. And the reason the borrower is anxious to borrow and willing to pay interest springs from the fact that his present needs are of a greater degree of intensity than those of the future. On account of this psychological fact, a stipulated sum of money in the present possesses greater utility than the same sum a year hence. $100 for present use is worth $105 a year hence. The $5 interest represents the difference between the utility of present use of the money and the estimate of its future utility. The loaning of money is a productive act in that it transfers wealth from the possession of one person to another to whom it has greater utility. This is especially true in the case of sickness or temporary misfortune where the need for present wealth is urgent, and more enterprises of the sort recently established in New York on the Morris plan whereby needy people are able to borrow on their personal credit at a reasonable rate are to be desired. Part of commercial rent, as already explained, is, in reality, interest, being a return for the capital invested in the land in the form of houses or other improvements. In all cases, whether the wealth loaned is applied to the production of future commodities or to satisfy the more pressing needs of the present, interest springs from the service that the use of the loan confers on the borrower.

The Rate of Interest.

The rate of interest will be determined by the marginal cost of saving on the supply side and on the demand side by the marginal productivity of capital goods. A large amount of saving would take place without any payment of interest and it is perfectly conceivable that the surplus wealth of a nation might exceed that required. The interest rate in Great Britain toward the latter part of the nineteenth century dropped for a time below 1 per cent. But as things are, some payment is necessary to induce a supply sufficient to satisfy the demand. The march of progress, invention, and the extension of business enterprise, not to speak of wars, which are agencies of destruction, all tend to increase the demand for capital. It is the marginal part of the supply that would be lacking if no payment were offered. A rate of interest just sufficient to induce this portion of the supply must be paid. With no inducement at all, a large accu-

mulation of wealth would take place. A rate of 2 per cent would increase the amount but not sufficient to supply existing need. To insure the quantity required, a higher rate, say 4 per cent, must be paid. This payment is just sufficient to make it worth while for the marginal savers to save the extra quantity required. This rate constitutes the supply price of loanable capital.

The demand price will be determined by the least profitable use to which the supply can be put. Some business men will be willing to pay a high rate of interest on account of the productivity of their enterprises. Were the rate, say, 10 per cent, rather than go without they would willingly pay it. But the amount of capital demanded at this high rate would find employment for only a small portion of the existing supply. A rate of 6 per cent would increase the amount demanded by making it worth while for more concerns to borrow and others to borrow more; while a rate of 4 per cent would make the demand about equal to the supply. This rate on the demand side would be equivalent to the least profitable use made of the borrowed capital and represents the productivity of capital at the margin. On the supply side it is equivalent to the marginal cost of saving. Should the rate of interest go any higher, the supply of loanable capital will increase because of the extra inducement to save, and at the same time the demand would fall off with the result that the rate will tend to fall. Should it fall below this equilibrium rate, saving will be discouraged, enterprise stimulated, and the rate will tend upward. Interest is the price paid for a loan of wealth, and, like any other price except that of land, it is based on marginal cost, on the one hand, and marginal utility, on the other.

We have spoken of *the* rate of interest because there is a tendency toward a general rate. Capital differs from land or labor in its degree of mobility. The loanable capital of a nation and of the world, for that matter, exists as a fund of money and credit which flows readily from one occupation or place to another. Competition, on the one hand, by business men in different industries and places for its use and, on the other hand, by those who own or control it to obtain the highest rates for it tends to equalize interest rates of loans within a nation and

even between different countries. This does not mean that all forms of loans bring exactly the same rate, but there is a tendency for the same kind of loans in any one country and for some kinds in all countries to be nearly equal. Capital in the form of money flows toward the most profitable market. If the rate is higher in New York than in London, loanable funds flow to New York and the increased supply there tends to lower the rate. The same is true of individual industries. If the earnings in one industry are greater than another, capital will be attracted to it. After a time, the increased supply will lower the earnings and the rate of interest will fall toward the general level.

Differences in the rate of interest are often due to other elements outside pure interest, which, strictly speaking, is the payment for the use of capital only. "Gross interest" may contain payments for management or storage, as in the cost of pawnbrokers' loans, or for repairs and replacement, as in the case of that part of commercial rent paid for improvements, which, as before stated, is strictly interest. Risk exerts a great influence on interest. The greater the risk, as a general rule, the higher the rate of interest. This is a truth that investors, especially amateur investors, would do well to paste in their hats. Safety of the principle is the first consideration in investing; a rate of interest as high as possible, the second. The reversal of this order often leads to the loss of both principal and interest. This, of course, is not always the case but often enough for the rule to stand. On account of safety, the governments of the great nations, well-known municipalities, and railroads are able to borrow at a lower rate than industrial concerns. British "consols" and United States bonds are as safe as is humanly possible. Municipalities seldom fail to meet their obligations. Railroads must run. This element of payment for risk is, in effect, compensation demanded by the lender on account of danger of loss to his principal. Distance, also, affects interest rates. Those localities or small countries far from the capital centers must usually pay a higher rate of interest. Their enterprises may be just as safe, in reality, as those nearer home, but they are not so well known, and, hence, as a rule, they must

pay a higher rate to induce distant owners of capital to loan them their wealth. The same truth applies to small, unknown enterprises which must often pay a higher rate to secure their funds than larger and better-known concerns whose securities are listed on the big exchanges.

Summary.

Interest is the share of the joint product of industry paid for the use of capital. The supply of capital depends on saving. The new capital of a country is drawn from two sources—the reinvested surpluses of business concerns, and the savings of individuals. Individual saving depends, first, on a surplus over the minimum requirements of the present. Beyond that it is a psychological process consisting of the balancing of present against future wants. Thrift depends on the ability to control present wants and the possession of foresight.

The source of demand for capital funds is the productivity of capital goods. With the money borrowed, business men procure production instruments with which they are able to produce a greater amount of wealth, but of this extra wealth interest is paid. The source of interest is thus found in the productivity of capital goods. In consumer loans, the borrower is willing to pay interest because his present needs are of a greater degree of intensity than his future wants. The interest which he is willing to pay represents the difference between the utility of the present use of the money and his estimate of its future utility. The loaning of money is a productive act in that it transfers wealth from the possession of one person to that of another to whom it has greater utility.

The rate of interest is determined on the supply side by the marginal cost of saving; on the demand side by the marginal productivity of capital goods. Because of the mobility of capital, there is a tendency toward a general rate of interest. Risk exerts a great influence on interest rates. "Gross interest" contains payments for management, storage, or other costs and should be distinguished from pure interest, which is payment for the use of capital only.

Test Questions

1. Distinguish between the supply of money and the supply of capital.
2. Name the different sources of new capital.
3. What are the factors on which saving depends?
4. What is the source of interest?
5. Why was interest condemned in ancient times?
6. Why is it justified today?
7. What determines the rate of interest?
8. Why is there a tendency toward a general rate of interest and not toward a general rate of wages?

References

Ashley, W. J., "English Economic History."
Böhm-Bawerk, E. von, "Capital and Interest."
Cassil, G., "Nature and Necessity of Interest."
Clay, H., "Economics for the General Reader," Chap. XVIII.
Edie, L. D., "Principles of the New Economics," Chap. VII.
Ely, R. T., "Outline of Economics," Chap. XXIV.
Fisher, I., "Capital and Income."
Gonner, E. C. K., "Principles," Part IV.
Jenks, J. W., "Great Fortunes."
Marshall, A., "Principles of Economics," Book 6, Chaps. VI–VIII.
Nicholson, J. S., "Principles of Political Economy," Book 2, Chap. XIII.
Pigou, A. C., "Economics of Welfare."
Seligman, E. R. A., "Principles of Economics," Chap. XXV.
Smith, A., "Wealth of Nations," Book 2.
Taussig, F. W., "Principles of Economics," Chaps. XXXVIII–XL.

CHAPTER XXIX

PROFIT

What is Profit?

We now come to the last and most elusive of the shares in distribution concerning which there is some difference of opinion. In its broadest sense, profit is a complex form of income containing elements of any or all of the other forms, rent, wages, and interest. It is the difference between the total expenses of an enterpriser or enterprise and receipts. The expenses of a business concern are the sums it pays for the other factors, land, labor, and capital; these sums constitute the incomes of these factors. When the concern hires or borrows the other factors, the sums paid for their use stand out clearly as rent, interest, and wages. But when the concern issues its own land, labor, or capital, the returns to these factors become merged in its profits. The question is, Are we to consider as profit all of the balance of the joint product of industry retained by the owners of the enterprise, or shall we analyze it into its constituent parts and count as profit only that share not imputable to the other factors whether owned by the enterprise or not. And if we are able to distinguish a fourth share of income entirely separate from that of land, labor, and capital, to what other factor is it to be attributed? Why should profit be paid? Has it any economic justification, or is it merely an excrescence, a sort of overflow from the earnings of the other factors, illicitly retained by those who employ and thus exploit them?

In business practice, that which is considered as profit varies. In the case of a tenant farmer, rent is an expense and will not be included in his profit, but he may fail to distinguish, from the balance of his receipts over expenses, separate payments of wages and interest for his own labor and capital. His profit will not include rent but might be held to comprise elements of wages

and interest. If he owns his own land, rent will also be included in his profits. Should he hire laborers, the wages of these will be part of his expenses, but he will be likely to lump his own wages of management in with his profit. In the same manner, a small storekeeper owning his property and using his own capital might count as profit his total sales after deducting expenses. This is sometimes termed "gross profit." Such a course is often grossly misleading, for his real profit is likely to be the Dutchman's 1 per cent or less; the tendency is to carry the analysis further and, at any rate, to distinguish rent and wages from profits, and such a course seems not only good practice but also sound theory. In partnerships, as Taussig instances, a distinction is sometimes made between interest and profit. From the net earnings there is first deducted an allowance for interest at the current rate for the capital used. Salaries for the active partner or partners are then paid out of the balance and the remainder is divided among the partners as profit. In the corporation form of organization, the analysis of the different shares is fairly complete. A distinction is made between borrowed capital and that owned by the corporation. Interest on borrowed capital, as on bonds or notes, is an expense. The return on capital invested in the concern, the actual value of which is hard to ascertain, is included in profits, which are paid in the form of dividends. Labor, including the labor of management, from foremen's wages to directors' fees, is all regarded as an expense. Rent for hired land is, of course, an expense, but the practice of listing as an expense the rental value of land owned and used by the corporation varies; usually, the profits of corporations contain traces of economic rent.

Whatever profit is or is not, one thing is clear: It is always the share paid to the enterpriser or owner of the enterprise. If we carry the analysis to the last ditch, after deducting from gross profit or net earnings the amounts imputable to land, labor, and capital owned and used by the enterprise, we still have a residue which we may term "pure profit." In practice, however, profit has no such narrow meaning, nor is there any reason in theory for so limiting it. If the business enterprise owns its own land or capital, the returns imputable to these factors belong to it. A business organization is comprised of land, labor,

and capital; these factors become merged in it in a new entity and the returns likewise become merged into profit.

Just as economic rent is the share of the joint product paid to the owners of land; wages, that paid to the laborer; and interest, that paid to the owner of capital, profit is the share paid to the owners of the business unit or organization for the part which it plays in the production of the joint product. It is based on the productivity of organization as a separate factor in production, just as rent rests on the productivity of land, wages on that of labor, and interest on the productivity of capital. The nature of organization and the function performed by it we have already explained. It is the structural unit, uniting the other factors into a producing concern. From the viewpoint of distribution, profit is the share of the joint product assigned to it for the service which it renders.

On the side of supply, profit is the supply price of organization, as interest is the supply price of capital. Capital comes into existence as a result of labor and saving; organization, as a result of labor saving and enterprise. Just as the supply of capital depends directly on saving, that of organization depends on enterprise. Business enterprise involves responsibility and risk. This responsibility and risk will not be undertaken for nothing. Profit is its reward and furnishes the incentive necessary to enterprise. Men will not undertake the organization of business enterprises merely for wages and interest. The primary motive for business activity is profit. It is the great regulator of industry. If profits are high in any particular branch of business or at any period, enterprise is stimulated; if low, it is discouraged. And under our present system of private enterprise, with its attendant risks and responsibilities, profit is as necessary as wages. Under a régime of Socialism, with the state shouldering the full responsibility of enterprise, or if the millennium were to arrive, profit might be dispensed with, but in the world as it is profit is not only a justifiable but also a necessary payment.

The Uncertainty of Business Enterprise.

The justification and necessity of profit lie largely in the risk and responsibility of business enterprise. Production takes place

in anticipation of demand. The enterpriser or enterprise estimates the wants of the community and the prices which it will be willing to pay. He then undertakes to satisfy those wants by uniting the other factors in such a manner as to produce the commodity or service at the estimated price. In so doing, he employs the other factors, paying for them or contracting to pay them at stipulated rates usually in advance of the receipt of the price and often before he has knowledge of what that price will be. These contracted expenses he must pay. What is left over constitutes his profit. This may be large or small or even nil, according as his judgment has been correct or conditions over which he has no control may change. If he is able to sell at a higher price than he anticipated, his profits are large; but, on the other hand, should the demand be less than he anticipated, or fall off in the interim, he must be content with a small profit or even suffer a loss. When prices rise, he is the first to feel the benefit; when they fall, the first to feel the shock. Indeed, if profit is the most alluring of the shares of distribution, it is surely the most volatile. Rent, wages, and interest are more stable forms of income. The owners of the other factors know in advance what their shares will be. They have contractual claims on the joint product. The entrepreneur has none. On the contrary, should the price of the joint product fall below the claims of the others, he must make these good out of his own pocket. The owners of the other factors prefer a certainty to an uncertainty, a smaller, perhaps, but a surer source of income. Rather than undertake the responsibility and risk of going into business for themselves, they prefer to hire or loan their labor or capital to others for a fixed return. The entrepreneur shoulders the responsibility of the enterprise and assumes the burden of the risk. His share lies on the lap of the gods, and, though it be the lion's share, like the lion he must take the chances of the chase.

Business risk, of course, varies. It is greater at some periods than others and in some businesses. At times of sudden change, as at the outbreak or close of a war or the approach of panic, it is increased. Sudden changes bring in their train big profit and big losses. Fortunes are made and lost almost overnight. The accompanying chart, which graphs the annual crop of business

failures in the United States and Canada from 1900 on, shows at a glance the effect of change on the hazards of enterprise. Note the rise following a panic and how the line is tossed high

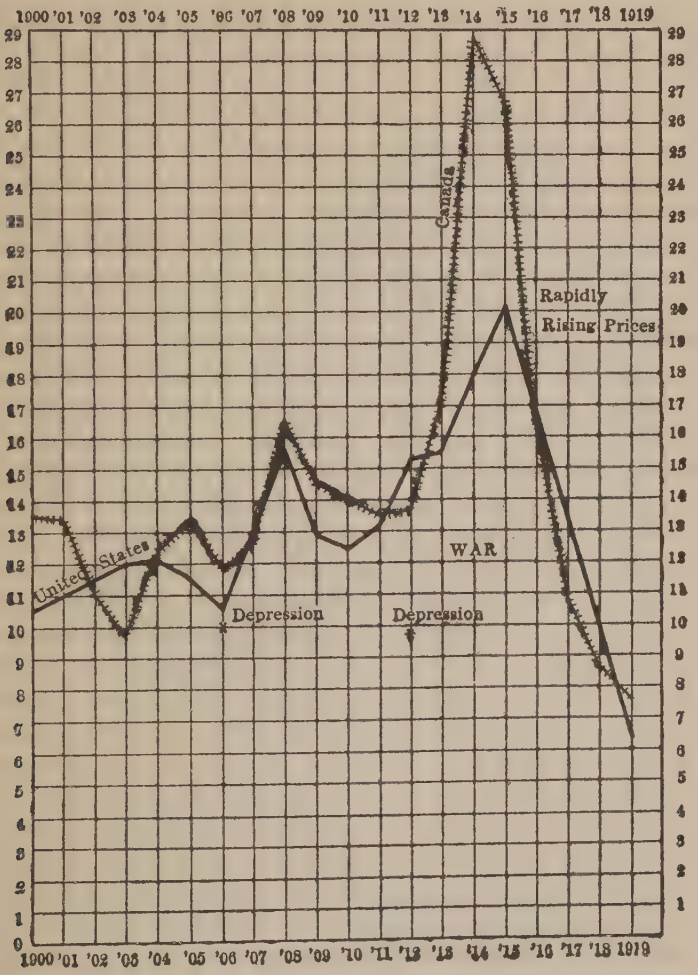

1900 '01 '02 '03 '04 '05 '06 '07 '08 '09 '10 '11 '12 '13 '14 '15 '16 '17 '18 1919
Canada
Rapidly Rising Prices
United States
WAR
Depression
Depression

Fig. 22.

in the air at the shock of war and how rapidly it recedes in the aftermath of rising prices. In periods of rapidly rising prices, the risk is lessened by the raising of the margin between price

and cost. In the war and postwar period, the margin was elevated to such an extent that the veriest tyro in business, however inefficient, made money, while the profits of many reached princely proportions. With the turn in the tide in 1920, this jovial state of affairs suddenly ceased. The number of business failures mounted from 6,451, in 1919, to 23,676, in 1922, the largest number ever known in the United States. The tables were turned, and it became as easy to lose as before it had been to gain. As the level of prices fell, it sank below the swollen costs of the previous period and in many places goods had to be sold at a loss. As the margin narrows, costs must be reduced, a premium is again placed on efficiency. The salesman no longer loafs around the office hearing the prayers of importunate buyers but is hustled off on the road to sell and is soundly berated because he has grown "soft." The "easy money" disappears, the crop of failures increases, business again becomes business.

For new businesses or in new industries the risk is greater. A large percentage of new businesses fail. Accurate statistics are hard to obtain. It has been estimated that "nine out of every ten corporations within ten years from the date of their formation have dissolved, failed, reorganized, or been swallowed up by other companies"; though it should be noted that the last two happenings by no means always denote loss. If we had mortality tables for business organizations, without doubt they would favor those of human beings in showing a high death rate during the period of infancy. And there are good reasons why; a new enterprise faces many perils both from within and from without—fraudulent promotion, incompetency or inexperience, insufficient capital, unforeseen competition, or inventions which may supersede its product. A new venture is always an uncertainty except in the ardent opinions of its organizers and promoters. In a new industry during the pioneer stage, the hazard is usually high and failures and losses frequent. When the preliminary experimental stage is passed, when the ground has been cleared and the main thoroughfares marked out and the industry gets its stride in the heyday of its youth, opportunities for making money are at their zenith. Such was the steel industry in the 'nineties, such was the rubber industry shortly after, and the automotive industry, and such is the radio industry today. Later on, when it

settles down into staid middle age, its possibilities realized, its methods standardized, the risks decrease and, likewise, the profits. In such an industry after competition has burnt itself out and the control falls into the hands of one large concern or a few who act together keeping up merely a show of competition, the risk is reduced to a minimum. Monopoly reduces the risk by virtue of its control over the conditions of supply or demand and the price and thus tends to entrench and often increase profit. Advertising, also, by reason of its control of demand lessens the risk. So, too, does the development of the science of organization and management, which points out the causes of failure and makes known the principles governing the successful conduct of enterprises. But all this notwithstanding, as long as industry is left to private enterprise and as long as change continues in the world, and change is but the working out of progress, the conduct of business enterprise will involve risk and responsibility, and unless human nature itself changes this risk will not be assumed for nothing.

In the light of this fact, profit performs a most essential and useful function in industry. It is at one and the same time the alpha and omega of business activity; desire for it is the force that fires the spirit of enterprise; realization of it supplies the reward. It is the invisible current that motivates the whole machinery of our economic system. It is the instigator of new enterprises and the extender of old. No risks are too great for it, no obstacle too big, no sacrifice too much. Curtail it and enterprise is curtailed; increase it and business activity is stimulated; destroy it and the very force on which progress depends is destroyed.

Losses and Profits in the Automotive Industry.

Some interesting facts which throw light on the losses and profits in a new industry have recently been brought out by Epstein in his study of the automotive industry. The period covered is from 1904 to 1926. Of the 181 companies engaged in passenger-car manufacturing over this 24-year period, 137 have "retired"; 44 now remain. Not all the concerns that "retired" failed, but at least 65 per cent, it has been ascertained, went into bankruptcy. Of the 44 concerns now in the automotive industry only 11 have been in business for the entire period. The aver-

age length of life for all the 181 companies has been 9.4 years. The study shows that as the length of life increases, the number of companies enjoying it decreases. Only 8 companies have remained in business 22 to 24 years, and only 33 per cent of concerns starting at any time in this period survived.

A comparison of the rate of failures in the automotive industry with Dunn's figures for general business failures shows the mortality of the former to be much higher than that of business in general. From 1923 to 1926, Dunn's record of business failures shows that in no year did the number of failures exceed 1 per cent of all concerns engaged in manufacturing, trading, and other commercial pursuits, 1922 excepted, when the record registered 1.2 per cent. Epstein's tables show that in several years during this period, the proportion of exits to the total number of concerns in the automotive industry was higher than 10 per cent and in some years reached 15 and 25 per cent. In his explanation of the causes of failures he says:

> Upon second thought, however, that there have been relatively so many automobile failures is not so surprising. One would expect the hazards to be greater in a new industry, especially one making a complex fabricated product subject to constant change and improvement in design and construction. This recurrent necessity of making innovations, both in the character of the product and in methods of manufacture if the place of a firm in the industry is to be maintained, probably serves to explain in large measure the complete disappearance of many automotive names that were once highly respected.

Changes in the mortality rate of the automotive industry at different stages in its development further establish the relation between risk and failure in a new industry. From 1905 to 1911, the proportion of failures mounted rapidly, reaching a climax in the year 1910, when the record shows that 25 per cent of all firms engaged in the industry retired. This abnormally high rate of mortality was due to the fact that the automotive industry was in a ferment of change. There was

> . . . constant uncertainty as to what the progress of the industrial arts would next bring forth, coupled with doubt as to the extent of the market and the preference of the public for particular types of vehicles.

From 1912 to 1921, the industry settled down; fundamental changes in design and in production became less frequent. Standardization of materials, parts, and product became the order of the day. Production on a steadily growing scale resulted in lowering costs. The rising price level of this period also contributed to lessen the risk. The proportion of failures gradually declined from 12 per cent, in 1912, to 1 per cent, in 1921. The crisis of 1920 and the depression of 1921 to 1922 again caused the proportion of failures to rise until, in 1924, it reached 21 per cent. Since 1924, however, failures have declined.

But if the losses in the automotive industry have been great, so, also, have the gains; with this difference, however, that the losses have fallen upon the many, while the gains have gone to the few. In his study of earnings, on account of lack of data, Epstein has not been able to include all of the concerns that have ever engaged in the industry. His compilation, however, embraces the ten leading enterprises which are separately controlled (counting General Motors as one company), while the number of producing units ranges from nine to fifteen throughout the period covered. Though these do not represent in any one year more than a quarter of the total companies engaged in the industry, they include the major part of the industry's invested capital, about 88 per cent in 1926, and produce the bulk of the output of the entire industry. The individual, as well as the average, earnings of this group of leading concerns are tabulated for the years 1910 to 1926. And while the average rate of earnings for the group is, no doubt, somewhat higher than for the industry as a whole, it undoubtedly indicates the trend of earnings in the automotive field throughout the period. In most years prior to 1917, this group of leading companies earned 30 per cent or over upon net worth. In three of these years, earnings amounted to 50 per cent or more upon capital invested. And never, except in 1921, have net earnings fallen below 15 per cent. During the earlier part of this period from 1910 to 1916, the average annual earnings were about 40 per cent. From 1917 on, they averaged 20 per cent, while in 1926, they stood at 19.8 per cent. Though the average earnings of the automotive industry in 1926 were still above normal, they were far below the halcyon rates of the earlier days when the industry was in the heyday of

its youth. Competition has begun its leveling process, and it is doubtful if profits in the automotive industry will ever reach the 40 to 50 per cent level of the period ending in 1917.

This tendency of the rate of profits to decline as the industry approaches maturity is strikingly shown in the trend of annual earnings of individual concerns. The Ford Company's percentage of net profit to net worth never fell below 45 per cent until 1917, and several times in earlier years its net income rose above 100 per cent, while in 1907 and 1910, net earnings rose to 378 and 215 per cent, respectively. After the year 1917, however, the Ford Company's rate of earnings began to decline. Only in two years since that time have they reached 40 per cent, though they have never fallen below 20 per cent except in 1924, 1925 and 1926, when the estimated[1] net profits fell to 18.3, 12.1, and 9.2 per cent, respectively. It should not be inferred from this that the total net profits of the Ford Company have declined but the rate of net profits to net worth. Lest one should be tempted to waste any sympathy on Mr. Ford, it may be said that the estimated net earnings of the Ford Company reached their climax in 1922, with the stupendous sum of $127,800,000.

The record of this remarkable company is unique in the annals of business. The Ford Motor Company was incorporated June 16, 1923, with a paid-in capital of $28,000. Not a dollar additional has been invested in this business outside of earnings. Its gross assets in 1926 totaled $784,000,000. Its net worth was approximately $700,000,000. All the stock of the company is owned by Mr. Ford, his wife, and his son Edsel B. Ford, who is at present its chief executive. In the beginning, Mr. Ford owned but 25.5 per cent of the stock. In 1909, he purchased sufficient from other stockholders to raise his holdings to 58.5 per cent; and in 1919, Edsel Ford purchased the remainder from Mr. Couzens, the Dodge brothers, and others, paying approximately $75,000,000 or $12,500 for each share of $100 par value. The company earned in net profits that year $69,000,000. It took courage to invest in the "horseless carriage" industry in its early days, but had some intrepid investor with faith in the future of automotive transportation risked $10,000 of his capital

[1] The Ford Company's profits have not been published since 1922. The estimates are Epstein's.

in the Ford Motor Company in 1903, with no additional cash invested, he would be worth today over $275,000,000.

In concluding this rather remarkable investigation, Epstein calls attention to what he terms the "conjunctural nature" of profits in the automotive industry; that is, that profits were a mixed return for both capital and business ability. The leaders in the industry have been real entrepreneurs in that they have risked their own capital in the enterprises which they have managed. It is only in recent years that any considerable volume of outside capital has been invested in the industry. The risks of manufacture were assumed by men with entrepreneural ability, but few capitalists were willing to venture their funds. Capital has been ploughed back continuously in the industry out of earnings. And the returns on this reinvested capital are inextricably mixed with the returns to the managerial ability of the men who decided to expand the business which they operated. In this new industry, therefore, profits appear principally as wages of management and as compensation for risk rather than as a high return on capital invested. A large number of those who undertook the responsibility and risks in the new industry failed. Those who possessed the foresight to vision the opportunities ahead, who had the courage to shoulder the risks and the entrepreneural ability to take advantage of the opportunities and overcome the difficulties in the pathway of progress, these have reaped a rich reward in profits.

Enterprise in the United States.

The growth and prosperity of the business organization of any nation depend on the enterprise of its people. On what, then, does enterprise depend? The essence of enterprise is leadership. Those who undertake the risk and responsibility of launching and running a business require, in a marked degree, the qualities of leadership. There are, of course, many qualities that go to make up a leader, chief among which are energy, initiative, knowledge, including a knowledge of human nature, constructive imagination, confidence, and courage, plus the practical faculty of getting things done. Any nation breeding men with these sterling qualities will never want for leaders in business or any other sphere of activity. The conditions of life in the United States,

especially in the early period of its history, have been such as to foster these characteristics in a marked degree. The typical American may be eclipsed in the more cautious quality of saving by those of the older races, but in enterprise he is second to none. No doubt, the foundation for this faculty was laid in the pioneer days of colonial times and the first display of it was the desire to launch out as a separate nation, an undertaking that has been eminently successful. National character, just as that of the individual, is mightily influenced by early environment. And the cradling of this great nation took place amid surroundings that could hardly do aught else but foster the qualities of leadership and independence. The pioneer life of the early settlers, with its unsettled conditions, its closeness to nature, its dangers, its freedom, lack of restraint, of conventions, and of standards, its riches of undeveloped resources waiting for the inventive genius of man, all invited enterprise. And the men who settled it responded to the call. Little wonder at this, for it was the pick of the old world, the adventurer, the liberty lover, the possessor of initiative and vision that sailed to its shores. Such a union of environment and human nature was bound to breed a race possessed or more than common enterprise. And the subsequent development of the country, its unparalleled rise in the space of a century to the richest among the nations of the earth, with an estimated wealth of $350,000,000,000 is its ample evidence.

There is no nation today where the spirit of enterprise burns more ardently than in the United States. In no other country is it so easily possible for any man to launch out for himself. No other country has produced greater entrepreneurs, men with a higher genius for the organization of land, labor, and capital into productive enterprises. Such men as Rockefeller in the oil industry, Hill and Harriman in transportation, Carnegie and Gary in the iron and steel industry, Bell and Vail in communication, Westinghouse and Steinmetz in the electrical field, Stone and Webster in water-power development, Morgan in the realm of finance, these and scores of others less well known are typical of the men whom this country has raised up from the ranks to take the lead in the organization of its industrial and commercial resources and of whom it may rightly be proud. It is true that these have not all been angels; their methods at times have

been harsh, their personal gains by no means small. But business is not exactly a pink tea; at bottom it smacks more of the nature of a battle, as the inside history of almost any branch of industrial enterprise will reveal. These men are the conquerors, real heroes in their respective fields, leaders where leaders have been needed; and if they have enriched themselves, they have more enriched their country. Men of their caliber, men gifted with vision, men with the courage of their convictions, ready to shoulder the risk and responsibility of affairs, men endowed with genius for organization, able to mould the forces of industry into productive shape on the scale called for by modern methods of large-scale production and successfully direct the course of their giant concerns through the storms of competition and changing conditions which sweep every industry during its upbuilding, leaders of this type every new country needs, and such men are not to be picked up on every street corner. Under the guidance of men of this type, the American corporation as a master form of enterprise has been developed to a high pitch of efficiency, the productivity of the country's land, labor, and capital has been increased, and its wealth enhanced. The famous ingenuity of the Yankee has nowhere been so signally displayed as in the field of business organization.

It may seem to some that freedom of enterprise in the United States is unduly subject to governmental interference. This country has been unfavorably compared with Germany, for instance, whose government, it is said, encourages and cooperates with business, while that of the States not only fails to give it the support it needs but also seems bent on hampering it with unnecessary legal restrictions. This has appeared so at times, yet some restriction is needed in this country because of the intensely individualistic nature of its enterprise, because of its exceptional freedom, lest that freedom should develop into license, while, on the contrary, in Germany with its prewar autocratic form of government there was little danger from this source, for the individual was entirely subservient to the government, which dominated business in common with all other activities, and the cooperation given, as in the dye industry, was usually to encourage the ulterior policies of the government. Such is the power of private enterprise in this country today that some control is needed. The

corporate form of organization with its centralization of control facilitates the concentration of power into the hands of one or a few individuals. One, or several acting together on the executive committee of a big holding company might with ease control a whole industry, or a few men controlling big corporate interests by collusion might dominate several industries. There are men in the United States today who hold in the hollow of their hands more power over their fellows than ever did the feudal barons of old. The actual control over affairs exercised by some of these modern barons of business and the possibilities of power through modern forms of business organization are far from being realized by the general public. Though business and big business, in particular, is apt to chafe at any measure of regulation, it is conservatively evident, considering the monopolistic nature of the powers exercised, that some regulation is for the general good. But whatever governmental control over private enterprise is exerted, its purpose should be to regulate and not to ristrict. Considering the important part played by enterprise in developing the resources of the nation and directing its business activities, to cripple it or even to hobble it with unnecessary legal restrictions would be detrimental to the welfare of the country. Any such control that results in preventing the organization or extension of business enterprises depresses business and not only lessens profits but also reduces the other shares in the bargain.

In the field of business, the call for leaders is as urgent today as ever and the opportunities are as great. In comparison with the Old World, this country is still undeveloped. In the race of the nations, the United States has a flying start, with a national wealth estimated at $350,000,000,000, over $230,000,000,000 more than that of the United Kingdom. It has the raw materials; it is no longer handicapped for capital; it has the skilled and unskilled labor and a body of going concerns as finely organized as those of any nation in existence. With the advance of progress there are always new fields of enterprise opening up. The bulk of the large industries of the past have been tied down to the earth in the development of its denser materials; science and invention are opening up the realm of the air. Synthetic chemistry introduces still another field preg-

nant with profitable opportunities for private enterprise. Science and invention are the pioneers, the discoverers; enterprise follows hard at their heels, to make the possibilities which they reveal realities for the use of all. Today, science seems to be leading us across the threshold of a new era of industrial development—an era that promises to be packed with opportunities for those who would steer the bolder course, who are willing and able to undertake the risk and responsibility of leadership, who have the vision to see, the brains to plan, and the ability to forge the factors of industry into productive shape.

The Difficulty of Gaging Profit.

Of all the shares of distribution profit is the most private. In the case of a competitive enterprise, it is perfectly natural for the concern to wish to keep its profits to itself, and there are good reasons from a business standpoint why it should. In the case of a public-utility company or a monopoly, the wish to keep the extent of their profit strictly private is also natural; but there are excellent reasons why the profits of these concerns should be accurately gaged and available to the inspection of federal or state commissions or other properly appointed persons. The desire for privacy in regard to profit by no means always springs from dishonest motives, nor are expedients used to conceal profits necessarily bad. But they make it extremely difficult to ascertain with any accuracy the extent of profits and often make it extremely easy to conceal profits for fraudulent purposes. Nominal profits are far from being real.

Overvaluation of purchases, undervaluation of inventories, excessive depreciation rates, charging capital goods to expense, watering of stock are, perhaps, the most common devices used to conceal profit. Some of these, as inflated purchase prices of supplies, are plainly criminal; others, such as the diversion of what otherwise would be profits into apparently excessive salaries or stock watering, may or may not be justifiable expedients. In the case of a partnership, it might be a matter of indifference whether the earnings were distributed in the form of profits or paid as salaries. In a close corporation, it might make little difference except as a ruse to dodge the income tax. If, however, a clique gains control of a large corporation and uses the oppor-

tunity to pay themselves and their friends excessive salaries, it would be a filching of funds properly belonging to the other stockholders.

Stock Watering and Overcapitalization.

Perhaps the most popular, at any rate the most widely known and condemned device for concealing corporation profits is stock watering. The term is said to have originated from the practice of the old cattlemen who in driving their herds to New York over the New Jersey swamps fed them with salt; the thirsty kine then imbibed so much water on their way to market that their weight was materially increased. In reference to corporations, stock watering consists in increasing capitalization by overvaluing present assets and issuing new securities based on this overvaluation; this lowers the dividend rate by spreading earnings of actual assets over a larger amount of outstanding stock. The ease with which excessive profits are concealed by this process is obvious. The same net earnings distributed over a larger capitalization mean a lower dividend rate. Suppose that after paying the usual 7 per cent on preferred, the balance of net earnings to be distributed among the holders of $1,000,000 common stock was $200,000, which represents a dividend rate of 20 per cent. The same net earnings distributed over $2,000,000 common stock would mean but a 10 per cent dividend. A going concern wishing to conceal unusually large earnings may by a revaluation of its capital assets satisfy the proper authorities of its right to increase its capitalization, issue new securities, sell or distribute them among its stockholders in the form of a stock dividend. Its dividend rate thereafter on the increased capitalization will be but normal. In the case of a new corporation or a reorganization with large anticipated earnings, the capitalization will be so adjusted as to permit the payment of dividends at the current rate. To go into details here would bring us into the realm of corporation finance, a most fascinating subject for light on which the reader is referred to W. H. Walker's excellent and practical treatise.

Stock watering is one method of overcapitalization. It is deliberate overcapitalization, and as such it is an evil practice. But it is doubtful whether all that is called "stock watering" is,

in reality, watering. In many cases, the capitalization is but brought up to its proper figure. Take the classic example of the United States Steel Corporation, which is said to have been "watered" to the tune of $550,000,000. In this transaction, $550,000,000 preferred and $550,000,000 common stock of the steel corporation plus $304,000,000 of its bonds were delivered to the promoting syndicate in exchange for the capital stock of the ten constituent steel companies, plus $25,000,000 in cash. The assumption is that the securities of the old companies represented the value of their capital assets and that the new corporation issued capital stock $550,000,000 in excess of the valuation of the properties of the old companies. The steel corporation claimed that the $550,000,000 represented the capitalized value of the economies made possible by the new corporation. The earnings of the corporation since have justified this claim. The new corporation was a more productive organization than were previously the ten old companies. The extra capital stock issued did not overvalue the productive power of the new corporation. It did mean tremendous profits to all those involved directly or indirectly in its organization. But those who conceived and carried out the reorganization created a tremendously efficient production unit. Their profits were huge, but so was the organization which they brought into being.

One of the most prolific causes of stock watering, real and supposed, is to obtain the profits of promotion. When a business is overcapitalized for this purpose through malice aforethought, it is, of course, criminal. But the organization or reorganization of corporations is by no means a light task, often a colossal one, and those who are able to carry it out must be paid for it. It is usually better, moreover, that they should be paid in stock of the companies which they aid in forming, as this tends to fix responsibility where responsibility belongs, for a time, at least. But whether paid in cash or stock, the amount of their payment should be based on the cost of their exertions, on the one side, and the productivity of the organization which they bring into being, on the other. Both of these are difficult to estimate; productivity is a thing of the future. Both are apt to be overestimated through self-interest or optimism. Nevertheless, the elimination of such profit or its too rigid curtailment would no doubt

discourage the organization of new enterprises and lead to depression.

The capitalization of a corporation represents or should represent its value as a factor in production. There is a considerable difference in practice and a still greater disagreement in theory as to the basis on which the valuation of a corporation should take place. The three bases of valuation are original cost of assets, cost of reproduction or replacement, and earning power. There is a tendency in theory to base value on cost alone and disregard productivity. But the value of a corporation, like that of a machine or a building, depends not only on cost but also on productivity. No matter what a machine has cost, no matter how valuable the materials of which it is constructed, if it can not be put to a productive use it is of little value. Similarly, with a corporation, no matter how costly its assets, no matter what its land, buildings, equipment, materials, patents, trade marks, services entering into its construction have cost, it is of little value unless it is able to produce its commodity or service at a price that will bring at least a profit that will cover its cost of operation. The corporation itself, distinct from its constituent parts, has a value as a productive unit. In actual practice, earning power is the basis of valuation, and the business world is justified in taking it into consideration. The valuation of a corporation should rest on both cost and productivity. But whatever the basis of valuation it will always be a matter of very uncertain estimate. The value of the capital assets of a business, especially of its intangible assets, is a matter of conjecture. It is in connection with these intangible assets that overvaluation frequently occurs, yet they are often the most valuable. The assets, moreover, change rapidly, either appreciating or deteriorating. Even if the capitalization of a corporation is equivalent to the value of its assets at its inception, there is no guarantee that they will remain so. Should they appreciate, the concern will be undercapitalized; should they deteriorate, it will be overcapitalized. Capitalization is, thus, a very elusive thing and it is difficult to tell whether watering has occurred or not. Fraudulent valuation is remarkably easy and overcapitalization is too common, as a glance at the quotations on the great exchanges show. The market price of a stock is,

generally speaking, a pretty fair test of its value, and the large number of stocks selling below par is an indication of the prevalence of overcapitalization. There is need for great conservatism. Better accounting methods, more publicity in regard to the details of promotion and organization of new enterprises and reorganizations, a more rigid governmental control in the issue of new securities, the removal of par value from common stock certificates, these will materially aid not only in preventing fraud but also in reducing overcapitalization in general.

Summary.

Profit is the share of the joint product of industry paid to the owners of the business unit for the part that it plays in production. In business, other elements of income may be included in what are termed "profits." In economics, this is termed "gross profit." The term "pure profit" is used to denote the share of the enterpriser after all other costs have been paid, as rent, interest, and wages, including interest on his own capital and wages of management. Profit is the reward for the risk and responsibility of business ownership. Its great economic function is to serve as a stimulus to business enterprise. The justification and necessity of profit lie largely in the risk and responsibility of business enterprise.

The industrial and commercial prosperity of any nation depends largely on the enterprise of its people. Entrepreneurs are needed with the ability to organize land, labor, and capital into productive enterprises. The rapid industrial growth of the United States has been due to the American genius for organization.

It is often difficult to ascertain real profits, owing to the ease with which profits may be concealed. Overvaluation of purchases, undervaluation of inventories, excessive depreciation rates, charging capital goods to expense, and stock watering are some of the devices used to conceal profits. Better accounting methods, more publicity in the promotion of new enterprises and in reorganizations, a more rigid governmental control in the issue of new securities will tend to prevent the fraudulent concealment of profit.

Test Questions

1. What is profit?
2. Why is the payment of profit essential in our economic system today?
3. What is the relation between risk and responsibility to profit?
4. What function does profit perform in industry?
5. Mention some of the qualities on which the entrepreneur's ability depends.
6. Name some of the expedients used to conceal profits.
7. What are the bases for the valuation of corporation assets?

References

CARVER, T. N., "Principles of Political Economy," Chap. 37.
CLARK, J. B., "The Distribution of Wealth."
CLAY, H., "Economics for the General Reader," Chap. XVIII.
FRIDAY, D., "Profits, Wages and Prices."
HADLEY, A. T., "Economics," Chaps. IV, IX.
HAWLEY, F. B., "Enterprise and the Productive Process."
MARSHALL, A., "Principles of Economics," Book 6, Chaps. VI–VII.
MARSHALL and LYON, "Our Economic Organization."
NICHOLSON, J. S., "Principles of Political Economy," Book 2, Chap. XIII; Book 4, Chap. VI.
SEAGER, H. R., "Principles of Economics," Chaps. XII, XIII.
SELIGMAN, E. R. A., "Principles of Economics," Chap. XXIII.
TAUSSIG, F. W., "Principles of Economics," Chaps. XLVIII–L.
VEBLEN, T. B., "Theory of Business Enterprise."
WATKINS, G. P., "The Growth of Large Fortunes."

INDEX

A

Academic education, relation to business success, 419
Advertising cost, 196
  criticism of, 199
  economy of, as a method of marketing, 196–199
  growth, 196
  services, 200
American Cigar Stores Co., 380
Arkwright, Richard, 57
Asbestos Textile Manufacturers Association, 244
Astor, John Jacob, 388
Automotive Industry; losses and profits, 447–451

B

Bank notes, 293, 294
  reserves, function of, 308
Banking, clearing house operations, 307
  elastic currency, 313
  Federal Reserve Act, 312
  how banks create credit, 303
  how banks provide a medium of exchange, 305
  liquid assets, 310
  loans, 303
  rediscounting, 314
  reserves, 315
Bell, G., 453
Bell Telephone system, 269
Bills of Exchange, 348
Bimetalism, 296
Birth rate, birth chart of principal nations, 410
Birth rate, declining in France, 411
  influenced by standard of living, 409
  in U. S., 411
Bohm-Bawerk, 79
Bureau of Labor Statistics, index numbers, 333, 335, 340, 341
Business associations, 243–245
  enterprise in U. S., 451
  failures in U. S., 445
By-products, savings in large-scale organizations, 143

C

California Association Raisin Co., 198
California Fruit Growers Exchange, 198
Capital assets, valuation of, 458
  definitions, 78
  derived nature, 77
  evolution, 89
  fixed and circulating, 81
  functions, 89
  goods, 80
  growth of, in U. S., 98
  how it increases production, 92
  maintenance, 86
  production of, 83
  relation to labor, 99
  as a store of wealth, 97
  see Contents, Chaps. VI, VII, XXVIII.
Capitalization, 456
Carnegie, Andrew, letters, 124
Cartwright, Edmund, 68
Central Office organizations, 129

Centralization of control, 106
City and store sites, value of, 379
Clay, Henry, 78, 421
Coal supply of U. S., 22, 29
Coinage, 286, 287
Combination, causes, 123
  kinds of, 120
  in steel industry, 121
Competition, cause of combinations, 123
  internal, 141
  unfair methods of, 277
Consumption goods, 80
Cooper production, 31
Corporations, financial organization, 112
  how created, advantages, 109–111
  number in different industries, 111
Cost, analysis of manufacturing cost, 212
  joint cost, 214
  law of decreasing cost, 225
  law of increasing cost, 220
  meaning of, 207
  real cost, 208
Credit, bank, 301–304
Currency, defined, 301

D

Darwin, Charles, 421
Death rates in principal nations, 408
Demand, creation of, 195
  elasticity of, 164
  forces behind, 174
  law of, 164
  meaning of, 162
  schedules, 163
  see Contents, Chaps. XIII, XIV.
  and supply, influenced by monopoly, 254
    law of, 162
    under competition, 165
    see Contents, Chaps. XII–XVIII.
Density of population, 415–416
Deposit currency, *see* Contents, Chap. XXI.
Depreciated currency, effect on rate of exchange, 354
Diminishing productivity, law of, 368
  returns, law of, 220, 368
  utility, law of, 175
Discount rate and rate of exchange, 353
Distribution of wealth, survey of, in U. S., 361–366
  see Contents, Chap. XXIV.
Division of labor, development of, 61
  disadvantages, 69
  geographical, 71–74
  in scientific management, 62
  simple and complex, 64
  ways in which it increases production, 66
  see Contents, Chap. V.

E

Economic system, 4
Economics, definition, 3, 6
  methods of, 6
  relation to specialized business sciences, 5
  see Contents, Chap. I.
Education and training, 418
Emerson efficiency system, 395
England and Wales birth rate, 411

F

Factors of production, 15
  value of, 367
Factory sites, factors influencing value, 379
Farm lands, factors influencing value, 378
Favorable balance of trade, 353
Federal Reserve Act, 312
Federal Reserve Notes, 294
Federal Reserve system, 312–322
Federal Trade Commission, 276

Finance bills, 353
Foreign Exchange, 348
  rate of, 349
Ford Motor Co., profits, 450
Forests, depletion of, in U. S., 19

G

Gantt, task and bonus plan, 395
Gary, Judge, 139
George, Henry, 382
Gold certificates, 291
  dollar, 286
  influence on prices, 343
  points, 349
  as standard money, 284–288
  stock of, in U. S., 289
Government regulation of industry, 270, 453
Greenbacks, 293
Gresham's law, 297

H

Halsey premium plan, 394
Hamilton, Alexander, report on manufactures, 16
Hargreaves, J., 68
Hill, James J., 434
Holding company, 119
Housewives services, value, 365

I

Immigration, 415
Income, growth of national income, 365
  income tax returns, 1921–1927, 195
  relative shares of labor and capital, 363–365
  survey of, in U. S., 361–366
Index numbers, 324–341
  retail, 339–341
  of wholesale prices in U. S., 333, 335, 337
Installment selling, 201
Integration, 139; 132
Intellectual processes, 52
Interest, forces determining rate of, 436
  gross interest, 438
  relation to risk to, 438
  see Contents, Chap. XXVIII.
"Invisible" balance of trade, 351
Iron resources of U. S., 27

J

James, William, 79
Jevons, W. S., 79
Job analysis, 59
Johnson, Joseph French, 430
Joint-cost, 214

K

King, W. I., 361
Kleinwachter, 78
Knauth, 361

L

Labor, division of, *see* Chap. V.
  efficiency of, *see* Contents, Chap. IV.
  four parts played by, *see* Contents, Chap. III.
  organization of, 422
  relation to value, 155
Lambert Pharmacal Co., 198
Land, causes of productivity, 308
  marginal, 382
  nationalization of, 387
  unique conditions of supply, 381
  see also Nature
Large scale organization, causes, 123
  development of, 120
  economics of, Chap. XIX.
  forms of, 96
Leadership, qualities of, 451
Legal tender, defined, 286
Localization of industry, 71

M

Machinery, evolution of, 89
how it increases production, 92
machine industry, 97
mechanization of industry in U. S., 95
Malthus, theory of population, 406
Man, as factor in production, *see* Contents, Chap. III.
qualities determining efficiency, *see* Contents, Chap. IV.
see also Wages.
Manhattan Island, purchase, 388
Margin of production, 378
Marginal utility, 176
law of, 177
relation to law of demand, 177
Market analysis, 193–195
Marx, K., 156
Maudslay, Henry, 93
Maximum gain, 182
Mechanization of Industry in U. S., 195
Mergers, 120
Mill, John Stuart, 387
Money, changes in value of, *see* Contents, Chap. XXVII.
functions, 283
kinds of, in U. S., 289
qualities of, 283
quantity theory of, 343
standard, 287
supplementary, 288
token, 289
see Contents, Chaps. XX, XXI.
Monopoly, classification of, 258
control by legislation, 270–279
law of monopoly price, 250
limitations, 252
nature of, 243, 258
power over price, 249
see Contents, Chap. XIX.

N

National banking system, 315
National Bureau of Economic Research, 361
Nationalization of land, 387
Natural resources, *see* Contents, Chap. II.
Nature, as a factor in production, *see* Contents, Chap. II.
New Industrial Revolution, 95

O

Open market operations, 319
Organization, defined, 103
essential features, 103
as a factor in production, 102
forms of, 107
large scale, Chap. IX.
see Contents, Chaps. VIII, IX, X.
Overcapitalization, 456

P

Patents, 259
Par of exchange, 348
Partnership, 108
Personal character traits influencing efficiency, 55
Personnel work, 57
Petroleum production, 32
Physiocrats, 16
Piecework, 393
Pools and gentlemen's agreements, 245
Population, birth charts of leading nations, 410
checks to, 407
death rates of leading nations, 408
density of, 415
external growth of, 416
growth of, in U. S., 415
increase in, of leading nations, 412
Malthusian theory of, 406
Price changes, *see* Contents, Chaps. XXII, XXIII.
defined as a measure of value, influence of cost on price, 1

Price changes, influence of monopoly on, Chap. XVIII.
effects of changes, 346
measurement of, by index numbers, 325
relation to value of money, 157, 324
retail prices in U. S., 337–341
wholesale prices in U. S., 333–337
Primary horsepower in U. S., 97
Production good, 367
Productivity of factor of production, 367
Profit, definition of, 441
Ford Motor Co. profits, 450
function of, 447
justification of, 443
profits in automotive industry, 447
relation to business enterprise, 443
Psychology, aid in analyzing and measuring human abilities, 49
Public utilities, 268

R

Real cost, 208
Rediscounting, 314
Rent, commercial and economic, 376
definition, 376
ethics of, 386
nature of, illustrated, 382
relation to wages, interest and profits, 385
see Contents, Chap. XXV.
Ricardo, D., 156
Risk in business enterprise, 444

S

Sales efficiency in large-scale organization, 142
Saving in modern society, 85
motives determining, 431
and the supply of capital, 430
Schwab, Charles, 138, 140
"Scientific management," relation to division of labor, 62
Sherman anti-trust act, 272
Silver certificates, 292
dollar, 291
Smith, Adam, 5, 421
Sole proprietorship, 107
see also Division of labor.
Specialization, plant, 138
relation to organization, 105
Standard of living, 409
Standardization of methods, 139
Steel industry, combination in, 121–126
destructive composition, 124
integration, 140
reorganization profits, 126
Sterling exchange, 349
Stock watering, 456
Supply, control of, *see* Monopoly.
determinants of, 206
influence of cost on, 207
schedules, 165
see Contents, Chaps. XV, XVI.

T

Taxation of land, 388
Taylor, Frederick W., system of scientific management, 62
Telephone industry, 269
Thorp, W. L., 128
Trade acceptance, 311
Trade Commission Act, 276

U

Unearned increment, 388
United States Steel Corporation, 121
reorganization profits, 126
Utility, diminishing, 175
marginal, 176
relation to demand, 175
relation to value, 153

V

Value, relation to distribution, 366
relation to exchange, 151
relation to utility, 153
see Contents, Chap. XI.
Voluntary control of birth rate, 409

W
Wages, factors influencing, on demand side, 399–403
on supply side, 407
iron law of, 398
money and real, 396
recent upward trend of, in U. S., 404
Wages, systems of wage payment, 392
see Contents, Chaps. XXVI, XXVII.
Wealth of U. S., 454
Webb-Pomerene Act, 278
Westinghouse, George, 454
Whitney, Eli, 93